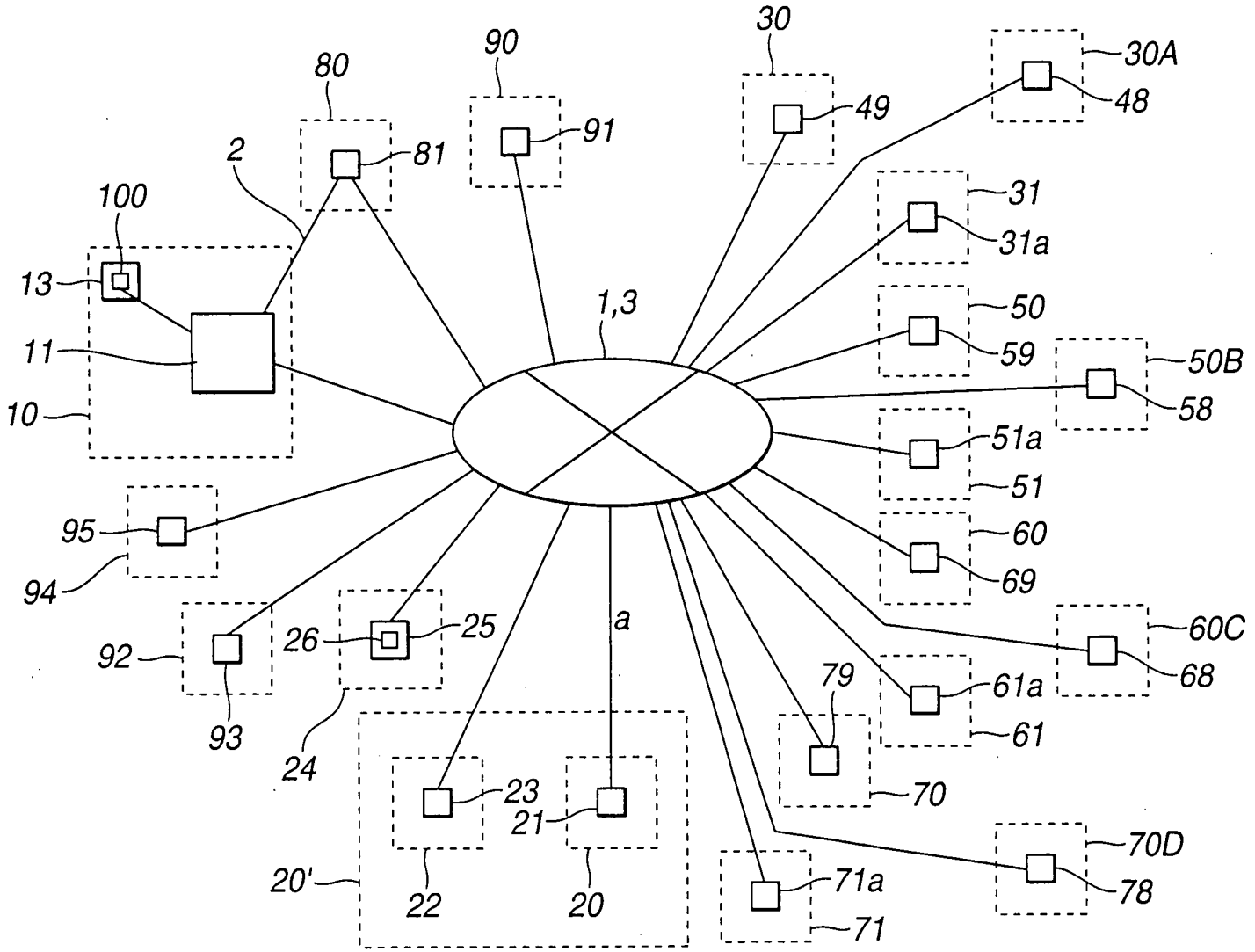
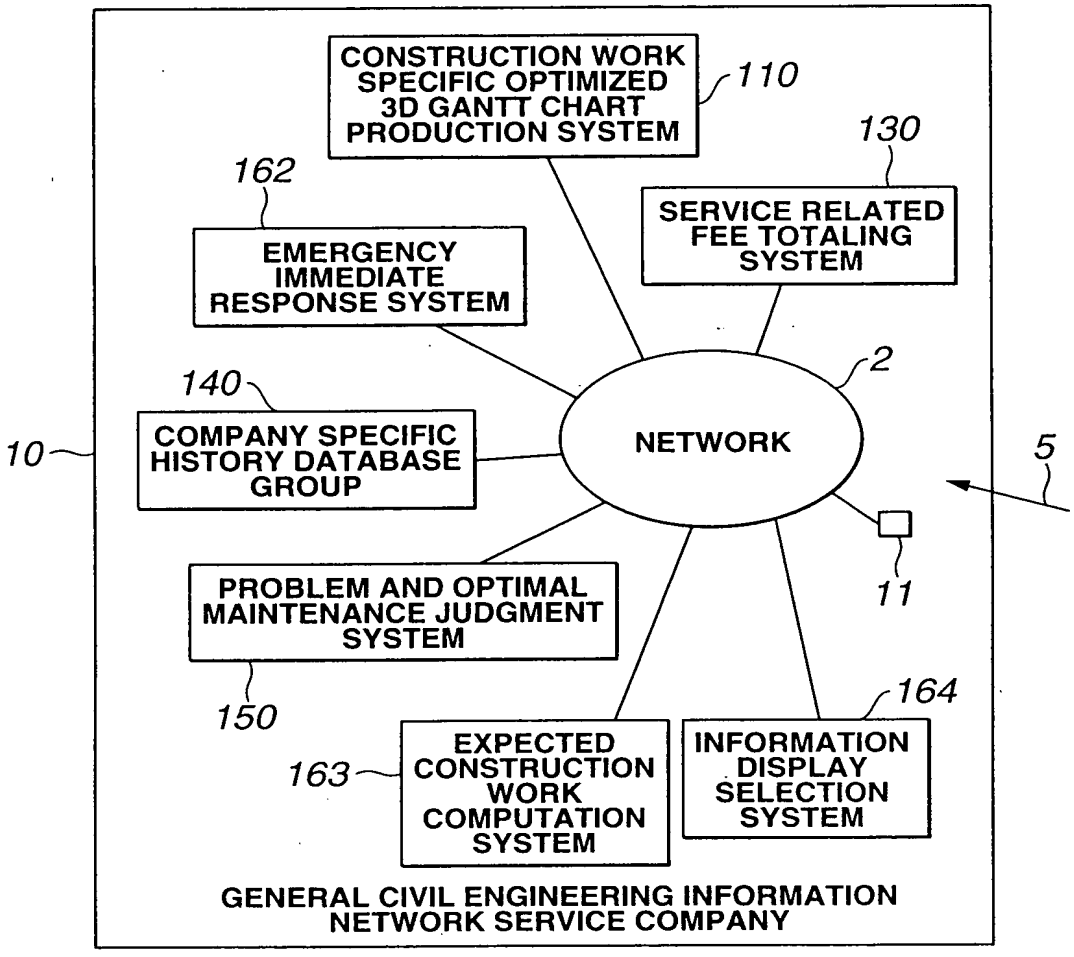
FIG.1


30
90
80
30A
48
49
91
81
2
100
31
31a
13
1,3
50
59
50B
11
58
10
51a
51
95
60
69
94
60C
68
92
26
25
a
79
61a
61
93
24
70
23
21
70D
20'
71a
78
22
20
71

(A) OF FIG.2


CONSTRUCTION WORK SPECIFIC OPTIMIZED 3D GANTT CHART PRODUCTION SYSTEM
110
130
162
SERVICE RELATED FEE TOTALING SYSTEM
EMERGENCY IMMEDIATE RESPONSE SYSTEM
2
140
10
COMPANY SPECIFIC HISTORY DATABASE GROUP
NETWORK
5
11
PROBLEM AND OPTIMAL MAINTENANCE JUDGMENT SYSTEM
150
164
163
EXPECTED CONSTRUCTION WORK COMPUTATION SYSTEM
INFORMATION DISPLAY SELECTION SYSTEM
GENERAL CIVIL ENGINEERING INFORMATION NETWORK SERVICE COMPANY

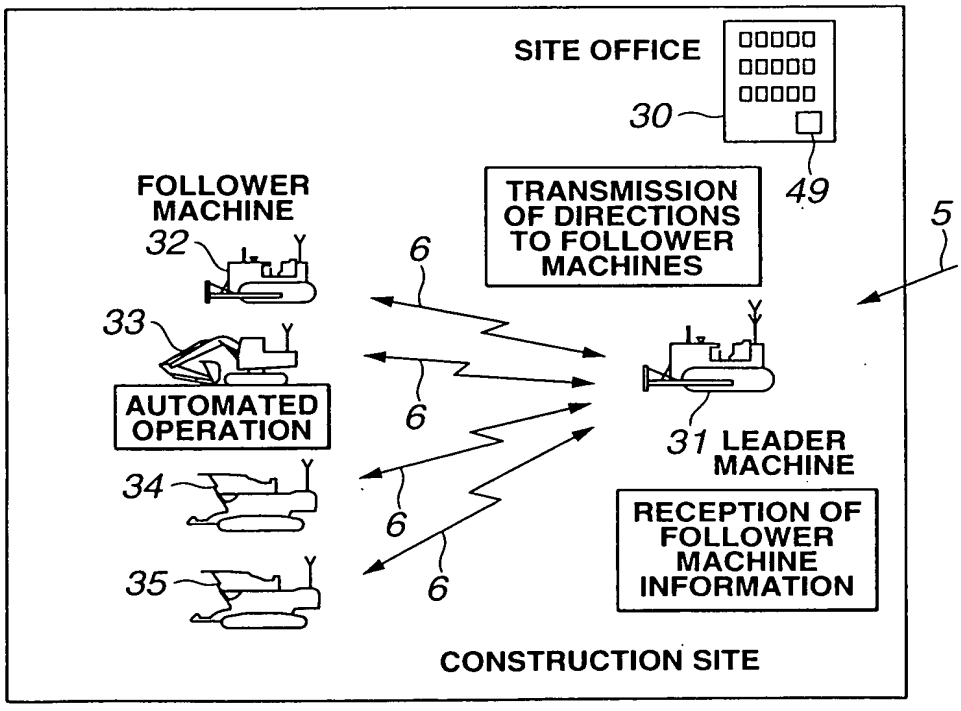
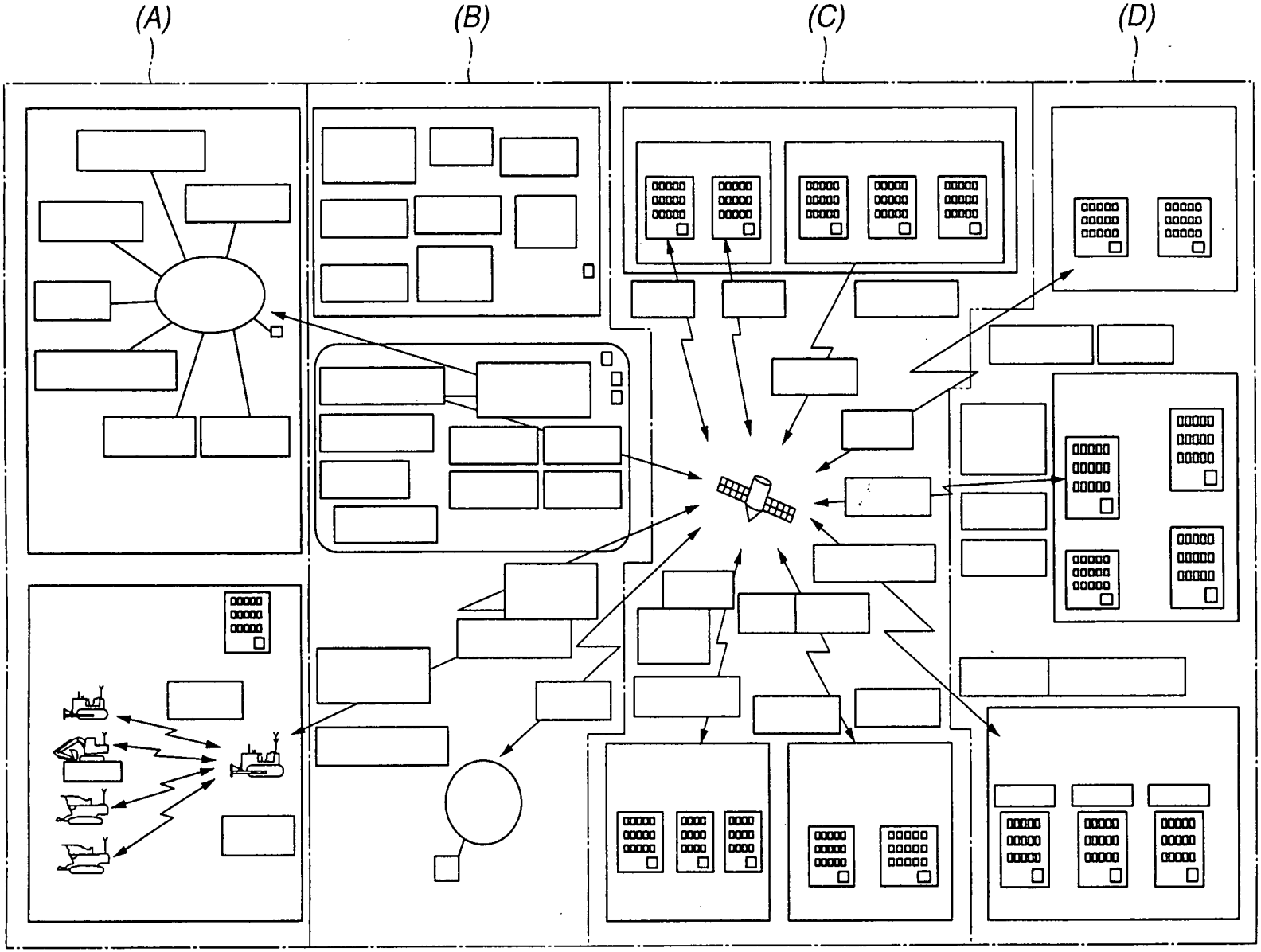
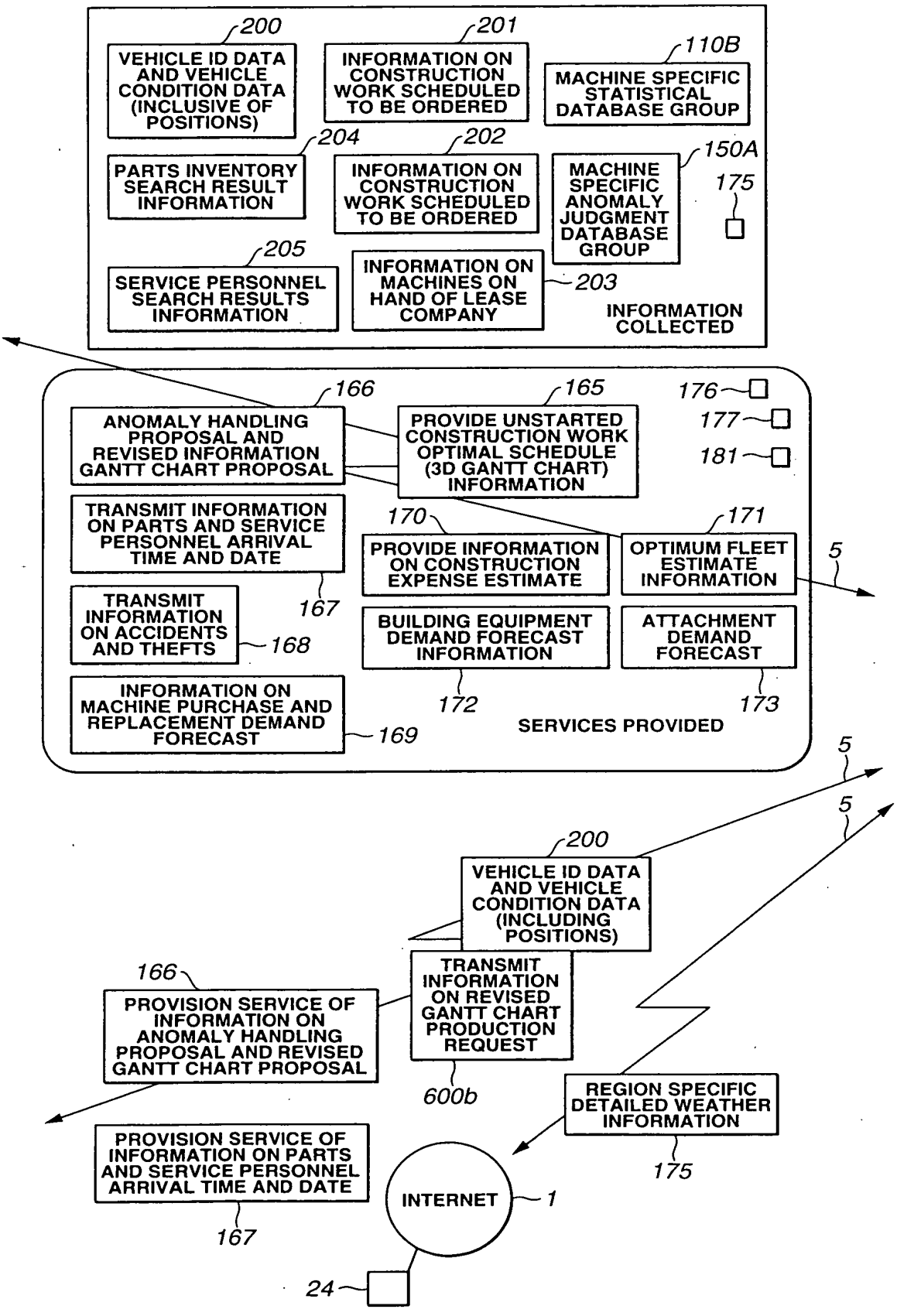

SITE OFFICE
30
49
FOLLOWER MACHINE
32
TRANSMISSION OF DIRECTIONS TO FOLLOWER MACHINES
5
6
33
AUTOMATED OPERATION
31 LEADER MACHINE
34
RECEPTION OF FOLLOWER MACHINE INFORMATION
35
CONSTRUCTION SITE

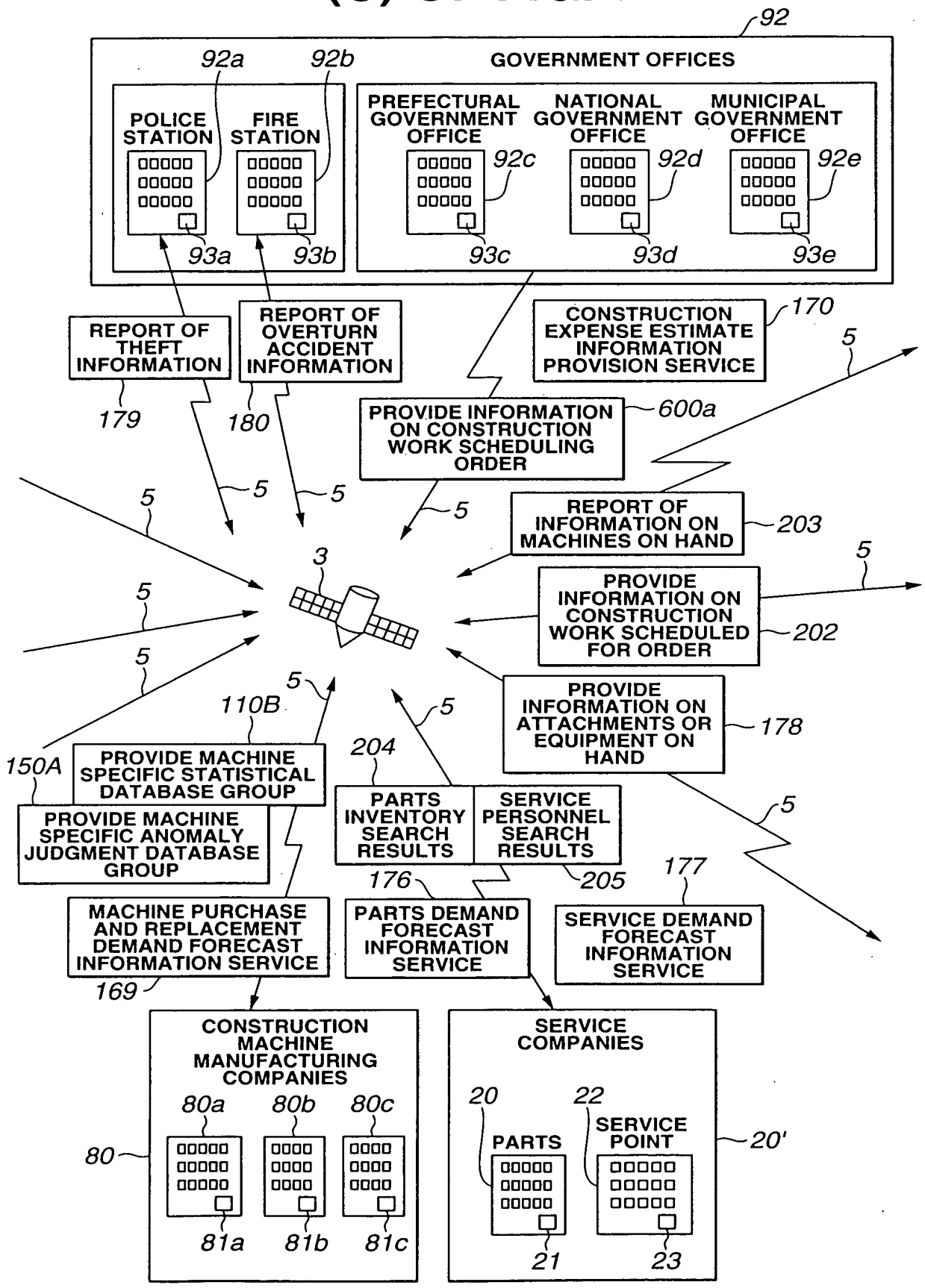
FIG.2



(B) OF FIG.2


200
VEHICLE ID DATA AND VEHICLE CONDITION DATA (INCLUSIVE OF POSITIONS)
201
INFORMATION ON CONSTRUCTION WORK SCHEDULED TO BE ORDERED
110B
MACHINE SPECIFIC STATISTICAL DATABASE GROUP
204
PARTS INVENTORY SEARCH RESULT INFORMATION
202
INFORMATION ON CONSTRUCTION WORK SCHEDULED TO BE ORDERED
150A
MACHINE SPECIFIC ANOMALY JUDGMENT DATABASE GROUP
175
205
SERVICE PERSONNEL SEARCH RESULTS INFORMATION
INFORMATION ON MACHINES ON HAND OF LEASE COMPANY
203
INFORMATION COLLECTED
166
ANOMALY HANDLING PROPOSAL AND REVISED INFORMATION GANTT CHART PROPOSAL
165
PROVIDE UNSTARTED CONSTRUCTION WORK OPTIMAL SCHEDULE (3D GANTT CHART) INFORMATION
176
177
181
TRANSMIT INFORMATION ON PARTS AND SERVICE PERSONNEL ARRIVAL TIME AND DATE
167
170
PROVIDE INFORMATION ON CONSTRUCTION EXPENSE ESTIMATE
171
OPTIMUM FLEET ESTIMATE INFORMATION
5
TRANSMIT INFORMATION ON ACCIDENTS AND THEFTS
168
BUILDING EQUIPMENT DEMAND FORECAST INFORMATION
ATTACHMENT DEMAND FORECAST
172
173
INFORMATION ON MACHINE PURCHASE AND REPLACEMENT DEMAND FORECAST
169
SERVICES PROVIDED
5
5
200
VEHICLE ID DATA AND VEHICLE CONDITION DATA (INCLUDING POSITIONS)
166
PROVISION SERVICE OF INFORMATION ON ANOMALY HANDLING PROPOSAL AND REVISED GANTT CHART PROPOSAL
TRANSMIT INFORMATION ON REVISED GANTT CHART PRODUCTION REQUEST
600b
REGION SPECIFIC DETAILED WEATHER INFORMATION
175
PROVISION SERVICE OF INFORMATION ON PARTS AND SERVICE PERSONNEL ARRIVAL TIME AND DATE
167
INTERNET
1
24

(C) OF FIG.2


92
92a
92b
GOVERNMENT OFFICES
POLICE STATION
FIRE STATION
PREFECTURAL GOVERNMENT OFFICE
NATIONAL GOVERNMENT OFFICE
MUNICIPAL GOVERNMENT OFFICE
92c
92d
92e
93a
93b
93c
93d
93e
REPORT OF THEFT INFORMATION
REPORT OF OVERTURN ACCIDENT INFORMATION
CONSTRUCTION EXPENSE ESTIMATE INFORMATION PROVISION SERVICE
170
179
180
5
PROVIDE INFORMATION ON CONSTRUCTION WORK SCHEDULING ORDER
600a
REPORT OF INFORMATION ON MACHINES ON HAND
203
3
PROVIDE INFORMATION ON CONSTRUCTION WORK SCHEDULED FOR ORDER
202
PROVIDE INFORMATION ON ATTACHMENTS OR EQUIPMENT ON HAND
178
110B
150A
PROVIDE MACHINE SPECIFIC STATISTICAL DATABASE GROUP
PROVIDE MACHINE SPECIFIC ANOMALY JUDGMENT DATABASE GROUP
204
PARTS INVENTORY SEARCH RESULTS
SERVICE PERSONNEL SEARCH RESULTS
205
176
177
MACHINE PURCHASE AND REPLACEMENT DEMAND FORECAST INFORMATION SERVICE
169
PARTS DEMAND FORECAST INFORMATION SERVICE
SERVICE DEMAND FORECAST INFORMATION SERVICE
CONSTRUCTION MACHINE MANUFACTURING COMPANIES
80a
80b
80c
80
81a
81b
81c
SERVICE COMPANIES
20
22
PARTS
SERVICE POINT
20'
21
23

(D) OF FIG.2

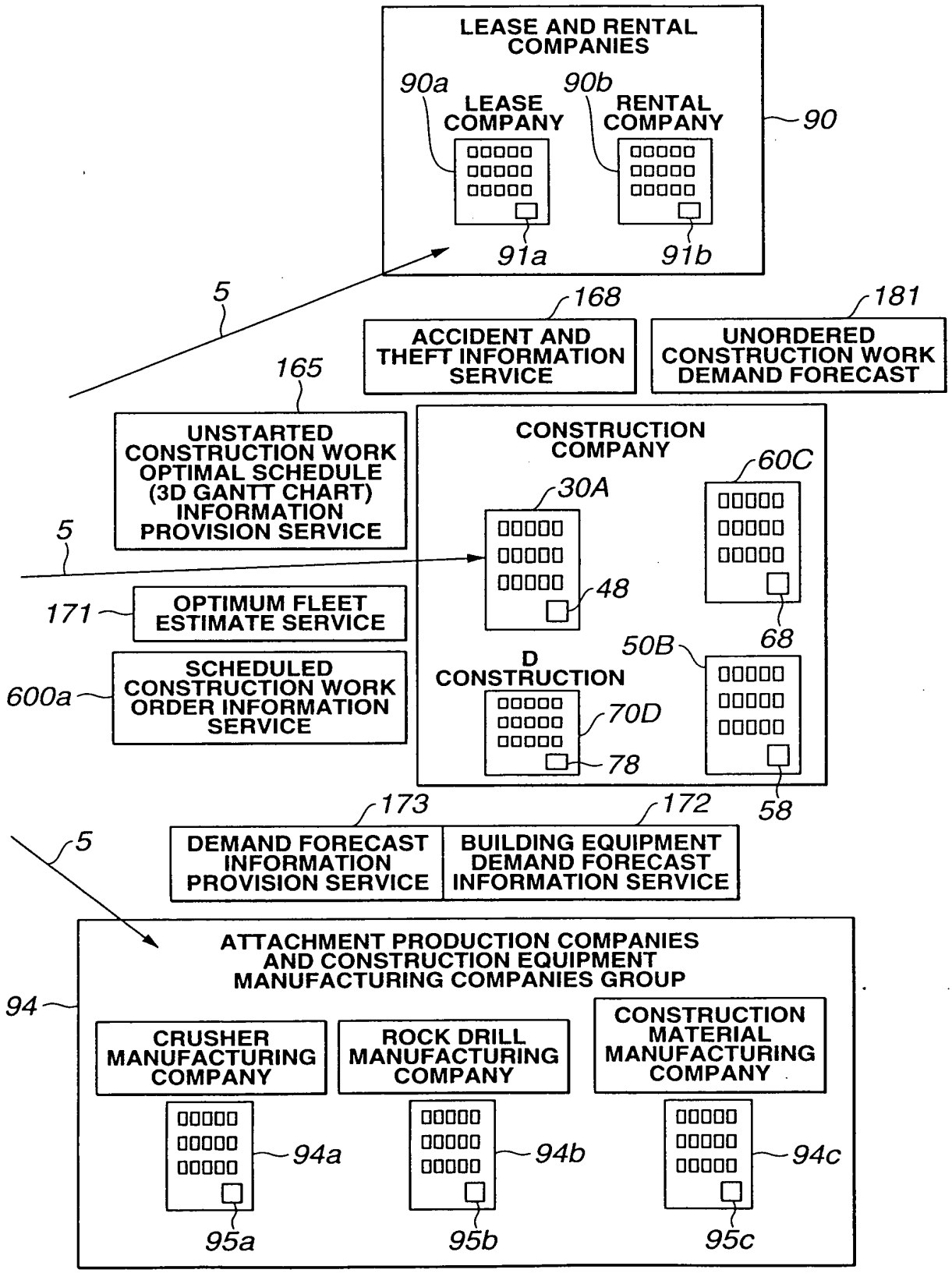
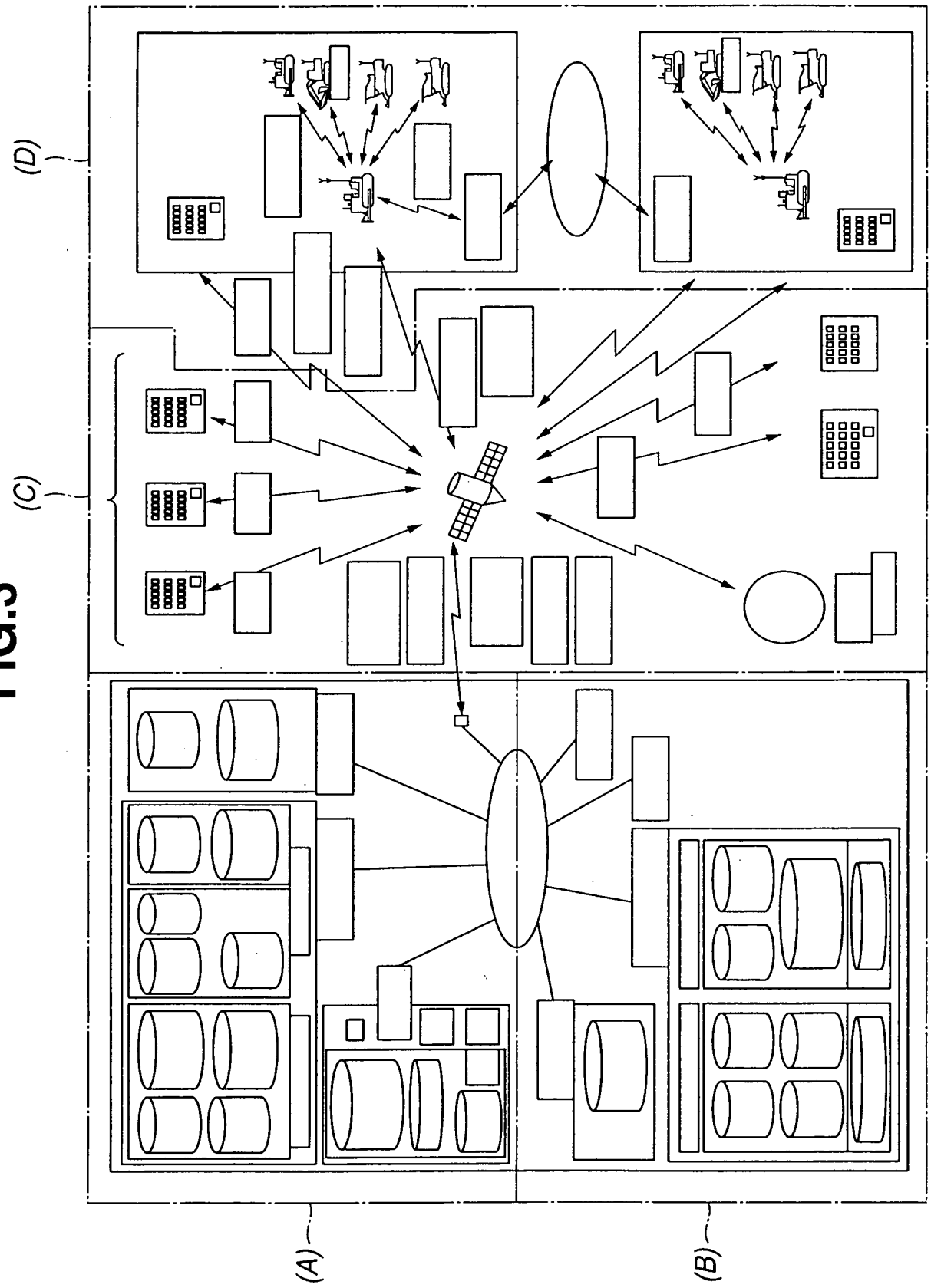
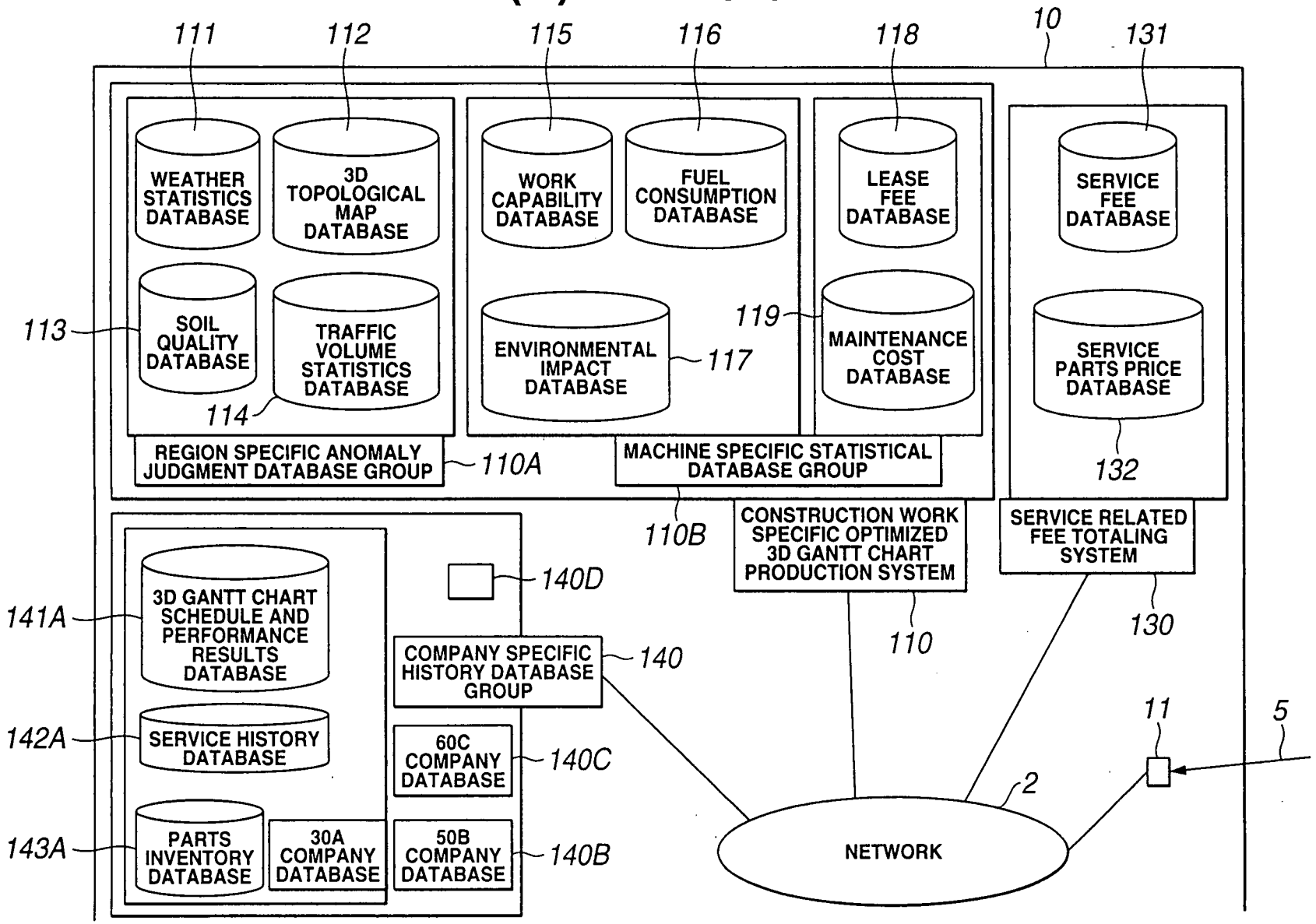

LEASE AND RENTAL COMPANIES
90a
LEASE COMPANY
90b
RENTAL COMPANY
90
91a
91b
5
168
ACCIDENT AND THEFT INFORMATION SERVICE
181
UNORDERED CONSTRUCTION WORK DEMAND FORECAST
165
UNSTARTED CONSTRUCTION WORK OPTIMAL SCHEDULE (3D GANTT CHART) INFORMATION PROVISION SERVICE
CONSTRUCTION COMPANY
60C
30A
5
48
171
OPTIMUM FLEET ESTIMATE SERVICE
68
50B
600a
SCHEDULED CONSTRUCTION WORK ORDER INFORMATION SERVICE
D CONSTRUCTION
70D
78
58
173
172
5
DEMAND FORECAST INFORMATION PROVISION SERVICE
BUILDING EQUIPMENT DEMAND FORECAST INFORMATION SERVICE
ATTACHMENT PRODUCTION COMPANIES AND CONSTRUCTION EQUIPMENT MANUFACTURING COMPANIES GROUP
94
CRUSHER MANUFACTURING COMPANY
ROCK DRILL MANUFACTURING COMPANY
CONSTRUCTION MATERIAL MANUFACTURING COMPANY
94a
94b
94c
95a
95b
95c

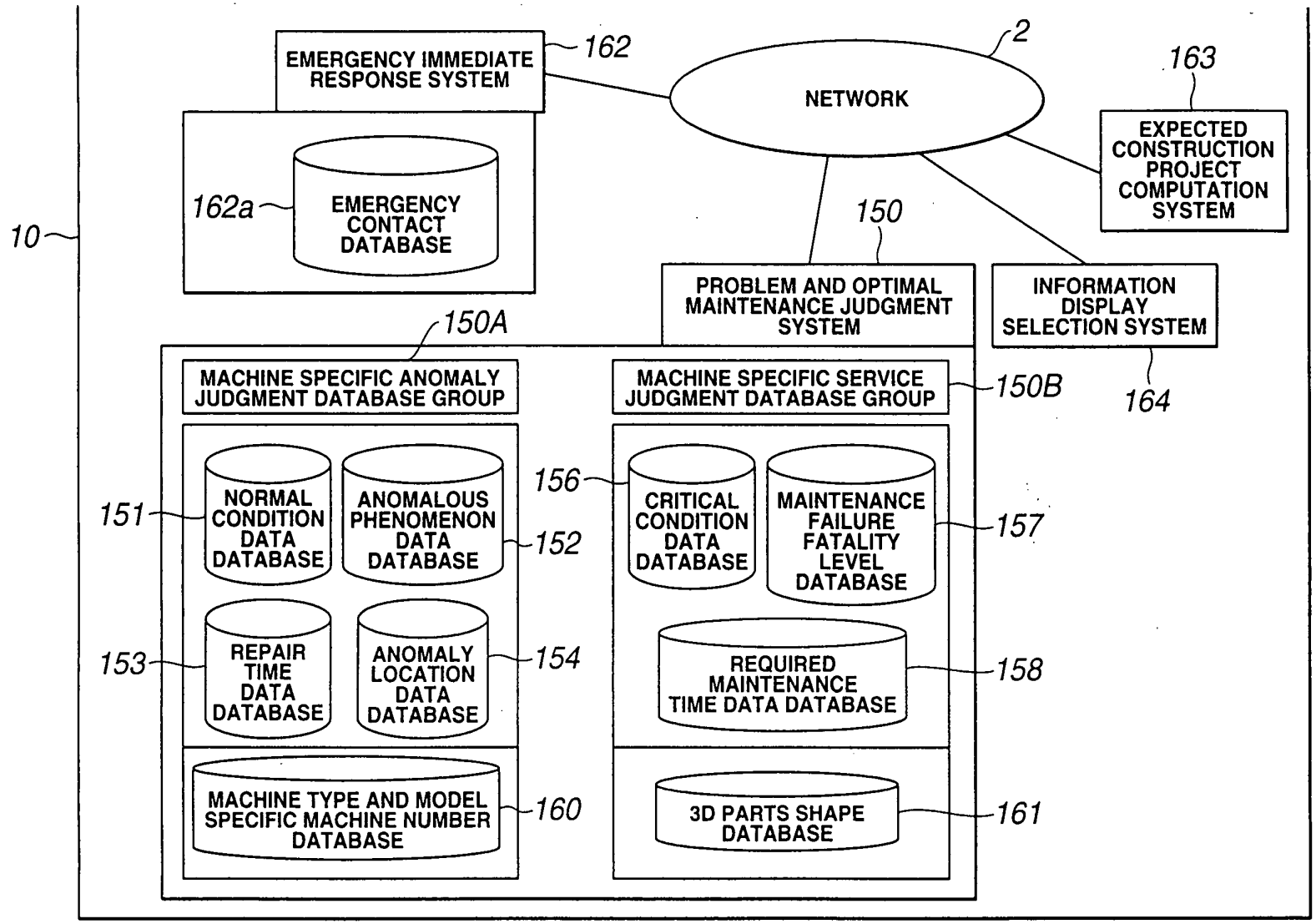
FIG.3



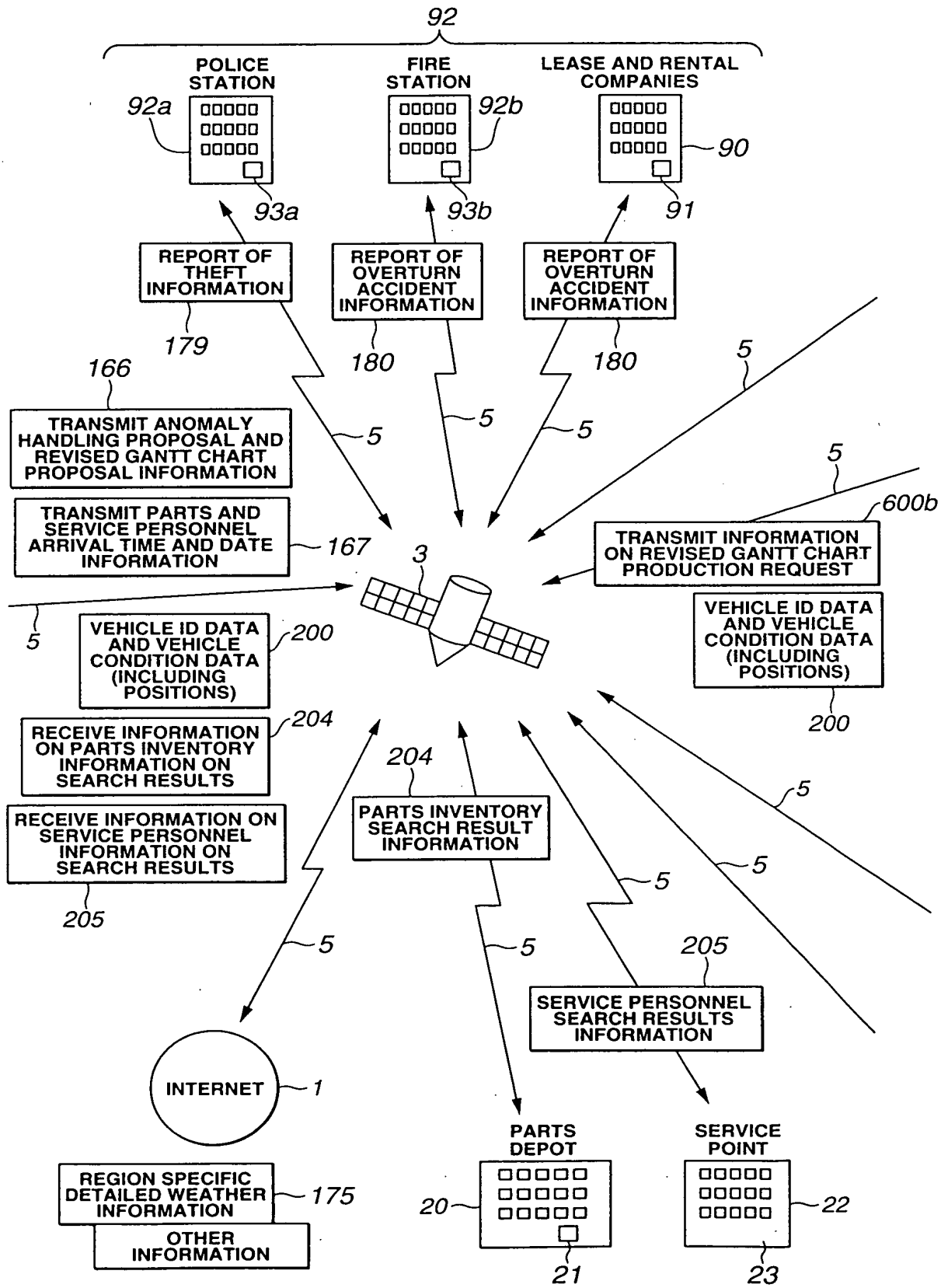
(A) OF FIG.3


111
112
115
116
118
10
131
WEATHER STATISTICS DATABASE
3D TOPOLOGICAL MAP DATABASE
WORK CAPABILITY DATABASE
FUEL CONSUMPTION DATABASE
LEASE FEE DATABASE
SERVICE FEE DATABASE
113
SOIL QUALITY DATABASE
TRAFFIC VOLUME STATISTICS DATABASE
114
ENVIRONMENTAL IMPACT DATABASE
117
119
MAINTENANCE COST DATABASE
SERVICE PARTS PRICE DATABASE
132
REGION SPECIFIC ANOMALY JUDGMENT DATABASE GROUP
110A
MACHINE SPECIFIC STATISTICAL DATABASE GROUP
110B
CONSTRUCTION WORK SPECIFIC OPTIMIZED 3D GANTT CHART PRODUCTION SYSTEM
110
SERVICE RELATED FEE TOTALING SYSTEM
130
140D
141A
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
COMPANY SPECIFIC HISTORY DATABASE GROUP
140
142A
SERVICE HISTORY DATABASE
60C COMPANY DATABASE
140C
11
5
2
143A
PARTS INVENTORY DATABASE
30A COMPANY DATABASE
50B COMPANY DATABASE
140B
NETWORK

(B) OF FIG.3


10
EMERGENCY IMMEDIATE RESPONSE SYSTEM
162
2
NETWORK
163
EXPECTED CONSTRUCTION PROJECT COMPUTATION SYSTEM
162a
EMERGENCY CONTACT DATABASE
150
PROBLEM AND OPTIMAL MAINTENANCE JUDGMENT SYSTEM
INFORMATION DISPLAY SELECTION SYSTEM
164
150A
MACHINE SPECIFIC ANOMALY JUDGMENT DATABASE GROUP
MACHINE SPECIFIC SERVICE JUDGMENT DATABASE GROUP
150B
151
NORMAL CONDITION DATA DATABASE
ANOMALOUS PHENOMENON DATA DATABASE
152
156
CRITICAL CONDITION DATA DATABASE
MAINTENANCE FAILURE FATALITY LEVEL DATABASE
157
153
REPAIR TIME DATA DATABASE
ANOMALY LOCATION DATA DATABASE
154
REQUIRED MAINTENANCE TIME DATA DATABASE
158
MACHINE TYPE AND MODEL SPECIFIC MACHINE NUMBER DATABASE
160
3D PARTS SHAPE DATABASE
161

(C) OF FIG.3


92
POLICE STATION
FIRE STATION
LEASE AND RENTAL COMPANIES
92a
92b
90
93a
93b
91
REPORT OF THEFT INFORMATION
REPORT OF OVERTURN ACCIDENT INFORMATION
REPORT OF OVERTURN ACCIDENT INFORMATION
179
180
180
166
TRANSMIT ANOMALY HANDLING PROPOSAL AND REVISED GANTT CHART PROPOSAL INFORMATION
TRANSMIT PARTS AND SERVICE PERSONNEL ARRIVAL TIME AND DATE INFORMATION
167
5
3
600b
TRANSMIT INFORMATION ON REVISED GANTT CHART PRODUCTION REQUEST
VEHICLE ID DATA AND VEHICLE CONDITION DATA (INCLUDING POSITIONS)
200
VEHICLE ID DATA AND VEHICLE CONDITION DATA (INCLUDING POSITIONS)
200
RECEIVE INFORMATION ON PARTS INVENTORY INFORMATION ON SEARCH RESULTS
204
RECEIVE INFORMATION ON SERVICE PERSONNEL INFORMATION ON SEARCH RESULTS
205
204
PARTS INVENTORY SEARCH RESULT INFORMATION
205
SERVICE PERSONNEL SEARCH RESULTS INFORMATION
INTERNET
1
REGION SPECIFIC DETAILED WEATHER INFORMATION
175
OTHER INFORMATION
PARTS DEPOT
20
21
SERVICE POINT
22
23

(D) OF FIG.3

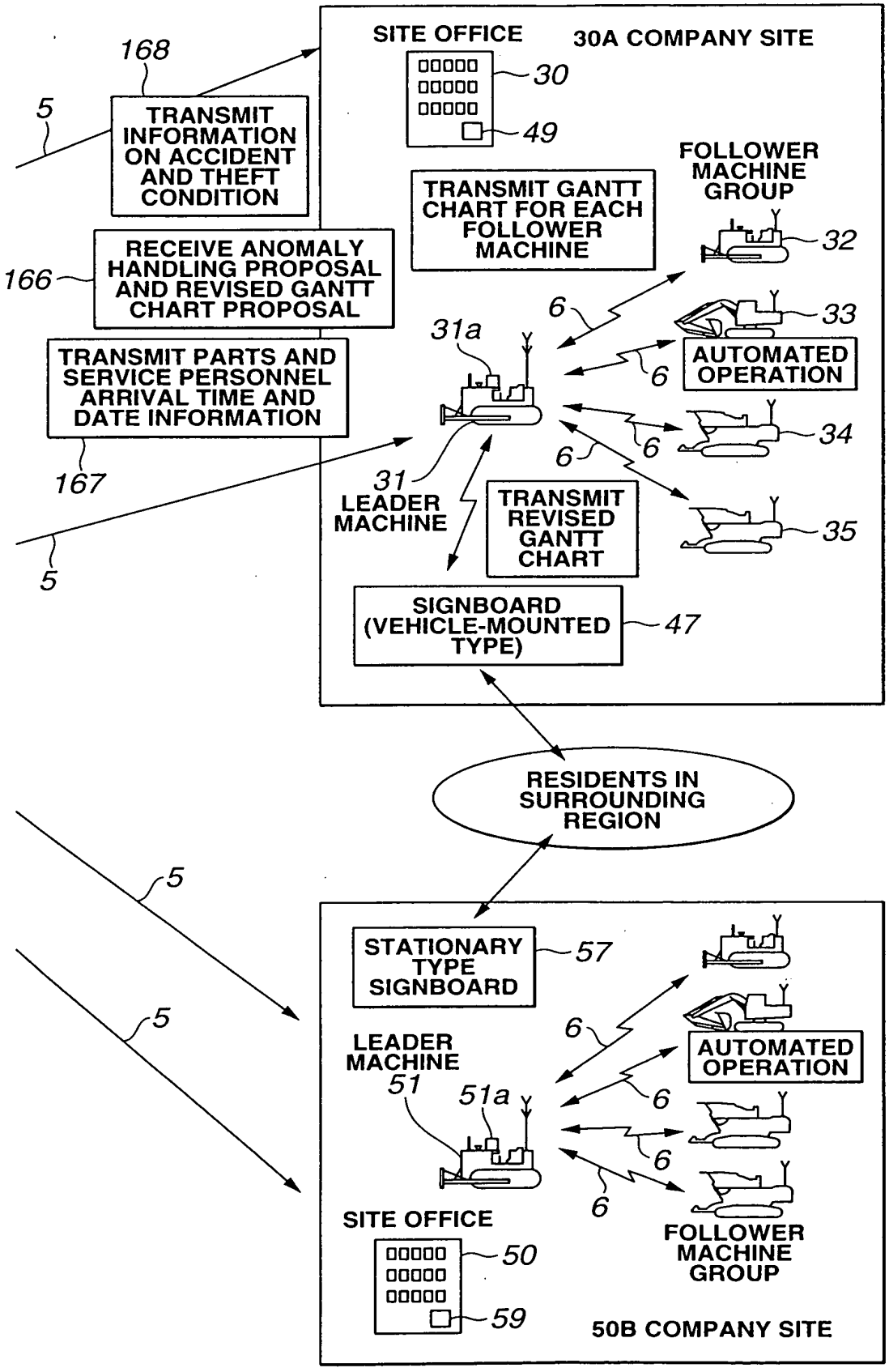

SITE OFFICE
30A COMPANY SITE
30
49
168
5
TRANSMIT INFORMATION ON ACCIDENT AND THEFT CONDITION
TRANSMIT GANTT CHART FOR EACH FOLLOWER MACHINE
FOLLOWER MACHINE GROUP
32
33
34
35
166
RECEIVE ANOMALY HANDLING PROPOSAL AND REVISED GANTT CHART PROPOSAL
TRANSMIT PARTS AND SERVICE PERSONNEL ARRIVAL TIME AND DATE INFORMATION
167
31a
6
AUTOMATED OPERATION
31
LEADER MACHINE
TRANSMIT REVISED GANTT CHART
SIGNBOARD (VEHICLE-MOUNTED TYPE)
47
RESIDENTS IN SURROUNDING REGION
STATIONARY TYPE SIGNBOARD
57
LEADER MACHINE
51
51a
AUTOMATED OPERATION
SITE OFFICE
50
59
FOLLOWER MACHINE GROUP
50B COMPANY SITE

FIG.4

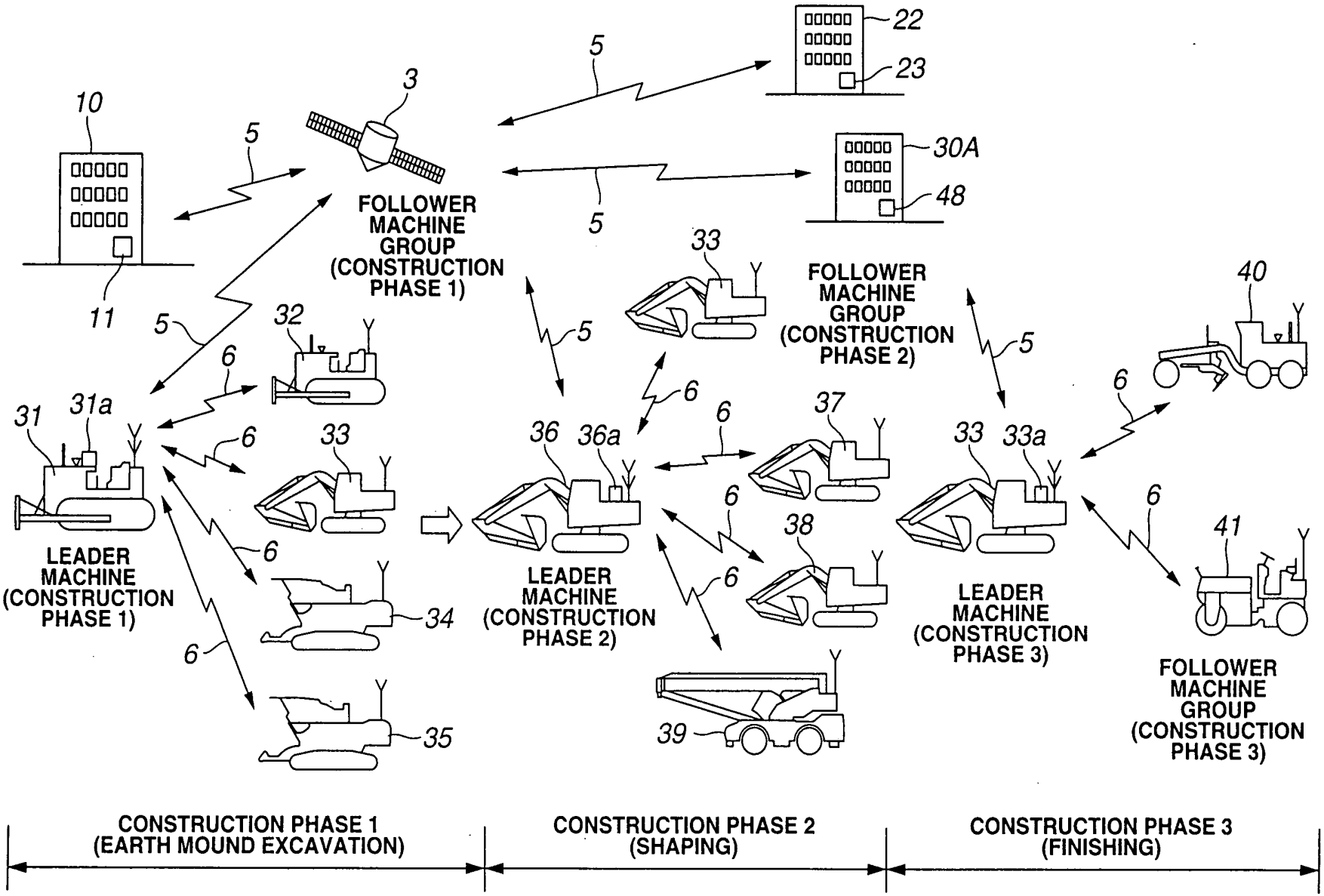
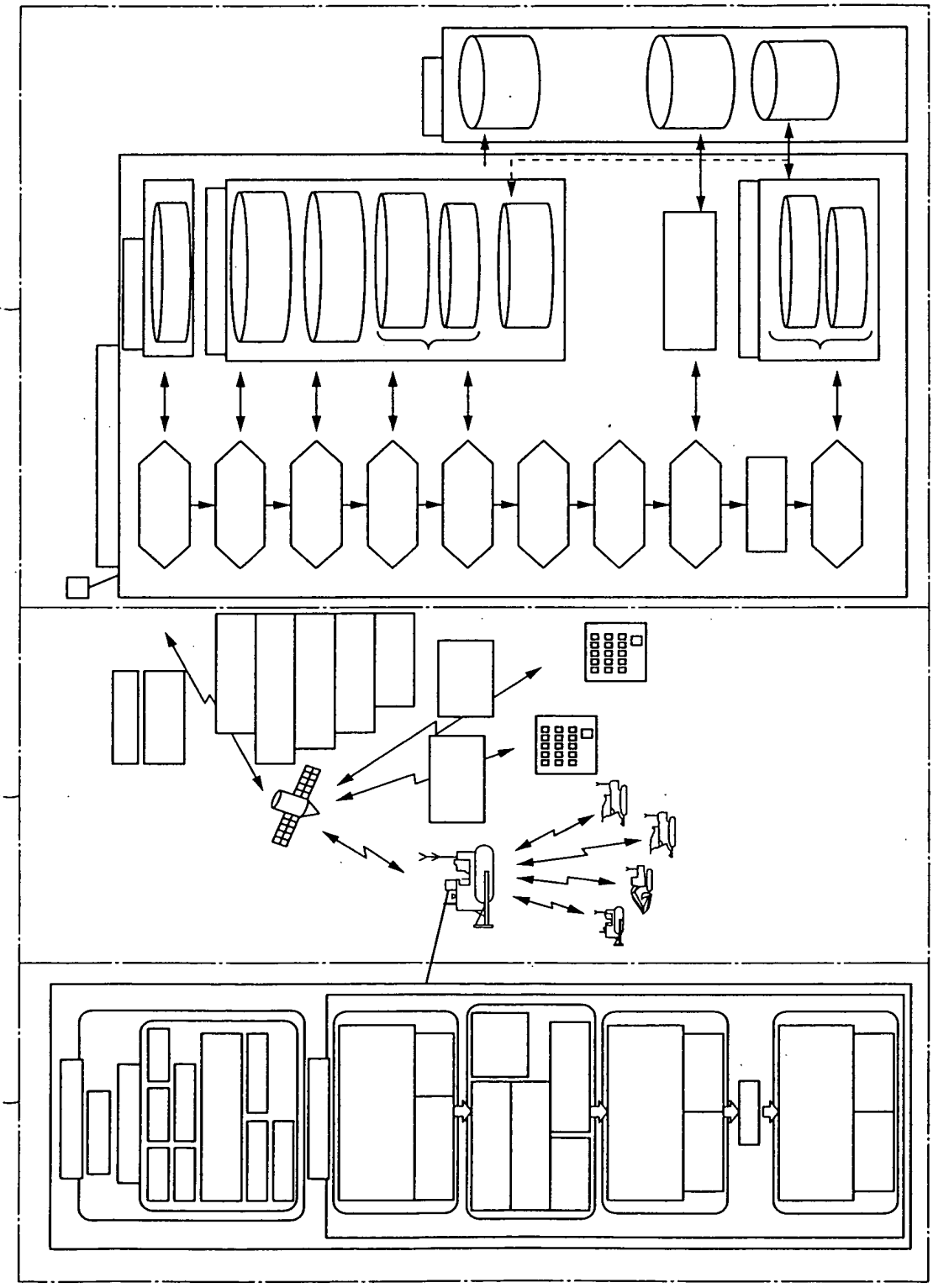
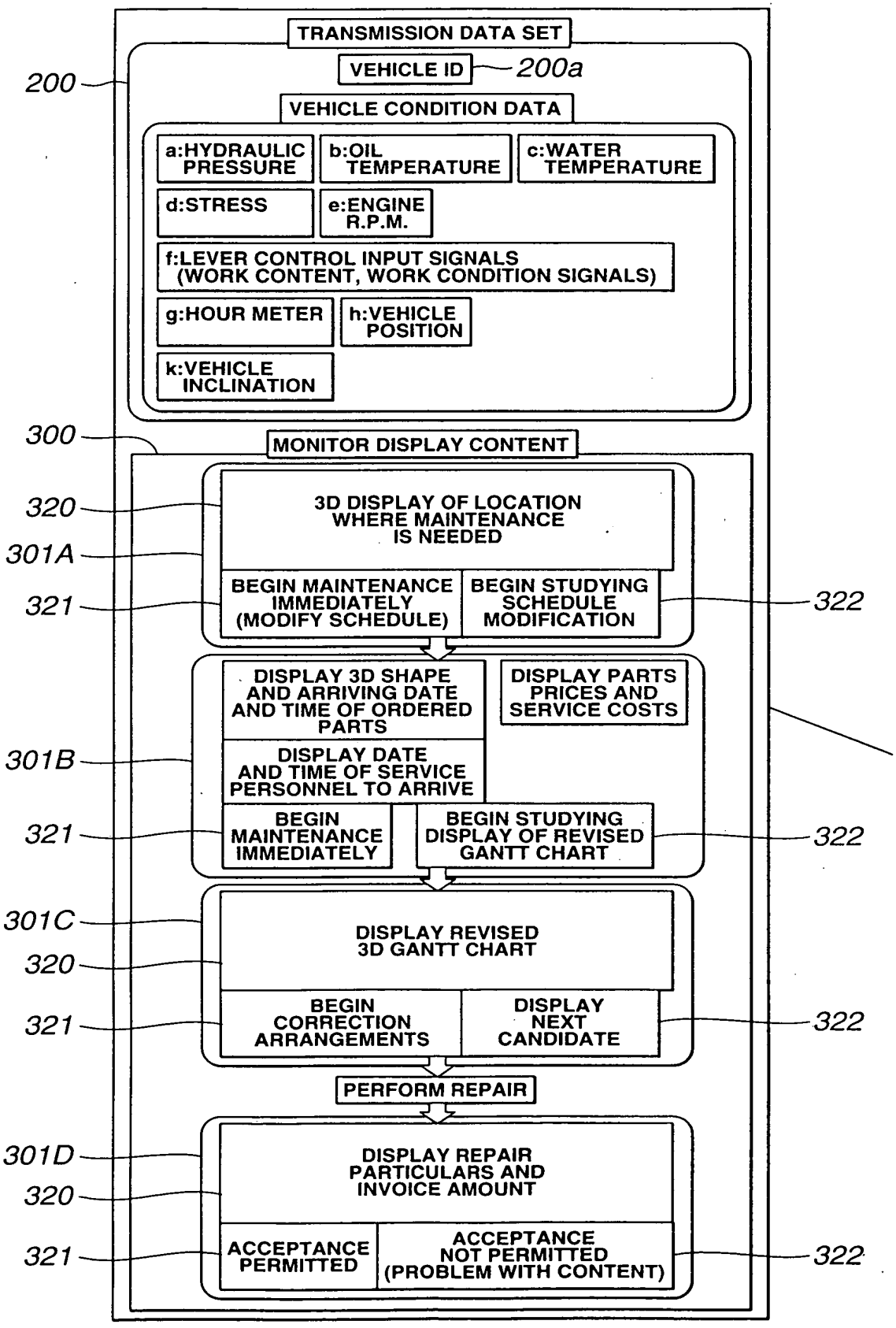

10
11
5
3
22
23
30A
48
FOLLOWER MACHINE GROUP (CONSTRUCTION PHASE 1)
FOLLOWER MACHINE GROUP (CONSTRUCTION PHASE 2)
FOLLOWER MACHINE GROUP (CONSTRUCTION PHASE 3)
31
31a
32
33
34
35
36
36a
37
38
39
40
41
33a
6
LEADER MACHINE (CONSTRUCTION PHASE 1)
LEADER MACHINE (CONSTRUCTION PHASE 2)
LEADER MACHINE (CONSTRUCTION PHASE 3)
CONSTRUCTION PHASE 1 (EARTH MOUND EXCAVATION)
CONSTRUCTION PHASE 2 (SHAPING)
CONSTRUCTION PHASE 3 (FINISHING)

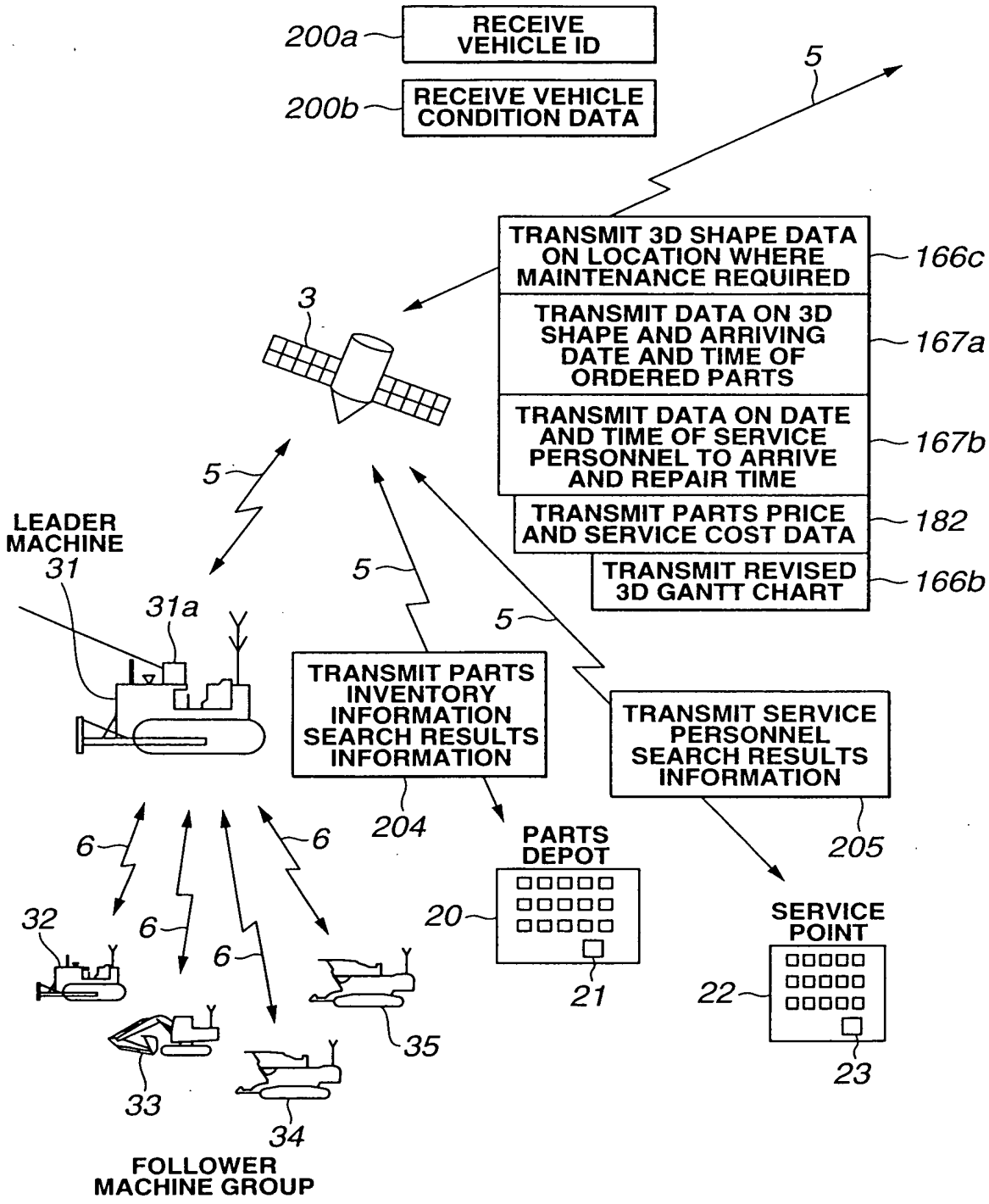
FIG.5



(A) OF FIG.5


TRANSMISSION DATA SET
VEHICLE ID
200a
200
VEHICLE CONDITION DATA
a:HYDRAULIC PRESSURE
b:OIL TEMPERATURE
c:WATER TEMPERATURE
d:STRESS
e:ENGINE R.P.M.
f:LEVER CONTROL INPUT SIGNALS (WORK CONTENT, WORK CONDITION SIGNALS)
g:HOUR METER
h:VEHICLE POSITION
k:VEHICLE INCLINATION
300
MONITOR DISPLAY CONTENT
320
3D DISPLAY OF LOCATION WHERE MAINTENANCE IS NEEDED
301A
321
BEGIN MAINTENANCE IMMEDIATELY (MODIFY SCHEDULE)
BEGIN STUDYING SCHEDULE MODIFICATION
322
DISPLAY 3D SHAPE AND ARRIVING DATE AND TIME OF ORDERED PARTS
DISPLAY PARTS PRICES AND SERVICE COSTS
301B
DISPLAY DATE AND TIME OF SERVICE PERSONNEL TO ARRIVE
321
BEGIN MAINTENANCE IMMEDIATELY
BEGIN STUDYING DISPLAY OF REVISED GANTT CHART
322
301C
DISPLAY REVISED 3D GANTT CHART
320
321
BEGIN CORRECTION ARRANGEMENTS
DISPLAY NEXT CANDIDATE
322
PERFORM REPAIR
301D
DISPLAY REPAIR PARTICULARS AND INVOICE AMOUNT
320
321
ACCEPTANCE PERMITTED
ACCEPTANCE NOT PERMITTED (PROBLEM WITH CONTENT)
322

(B) OF FIG.5


200a
RECEIVE VEHICLE ID
200b
RECEIVE VEHICLE CONDITION DATA
5
TRANSMIT 3D SHAPE DATA ON LOCATION WHERE MAINTENANCE REQUIRED
166c
TRANSMIT DATA ON 3D SHAPE AND ARRIVING DATE AND TIME OF ORDERED PARTS
167a
TRANSMIT DATA ON DATE AND TIME OF SERVICE PERSONNEL TO ARRIVE AND REPAIR TIME
167b
TRANSMIT PARTS PRICE AND SERVICE COST DATA
182
TRANSMIT REVISED 3D GANTT CHART
166b
3
LEADER MACHINE
31
31a
TRANSMIT PARTS INVENTORY INFORMATION SEARCH RESULTS INFORMATION
204
TRANSMIT SERVICE PERSONNEL SEARCH RESULTS INFORMATION
205
PARTS DEPOT
20
21
SERVICE POINT
22
23
6
32
33
34
35
FOLLOWER MACHINE GROUP

(C) OF FIG.5

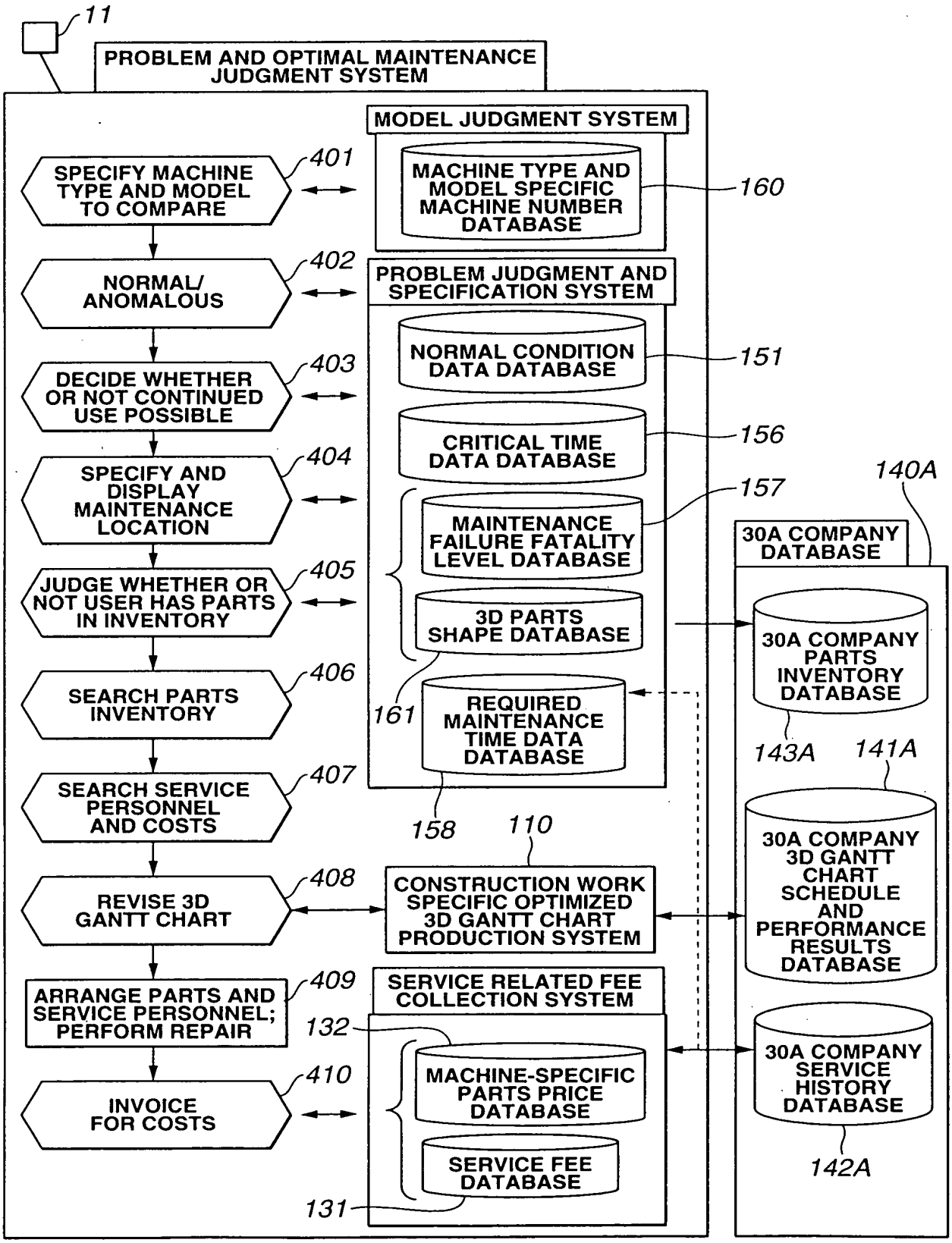
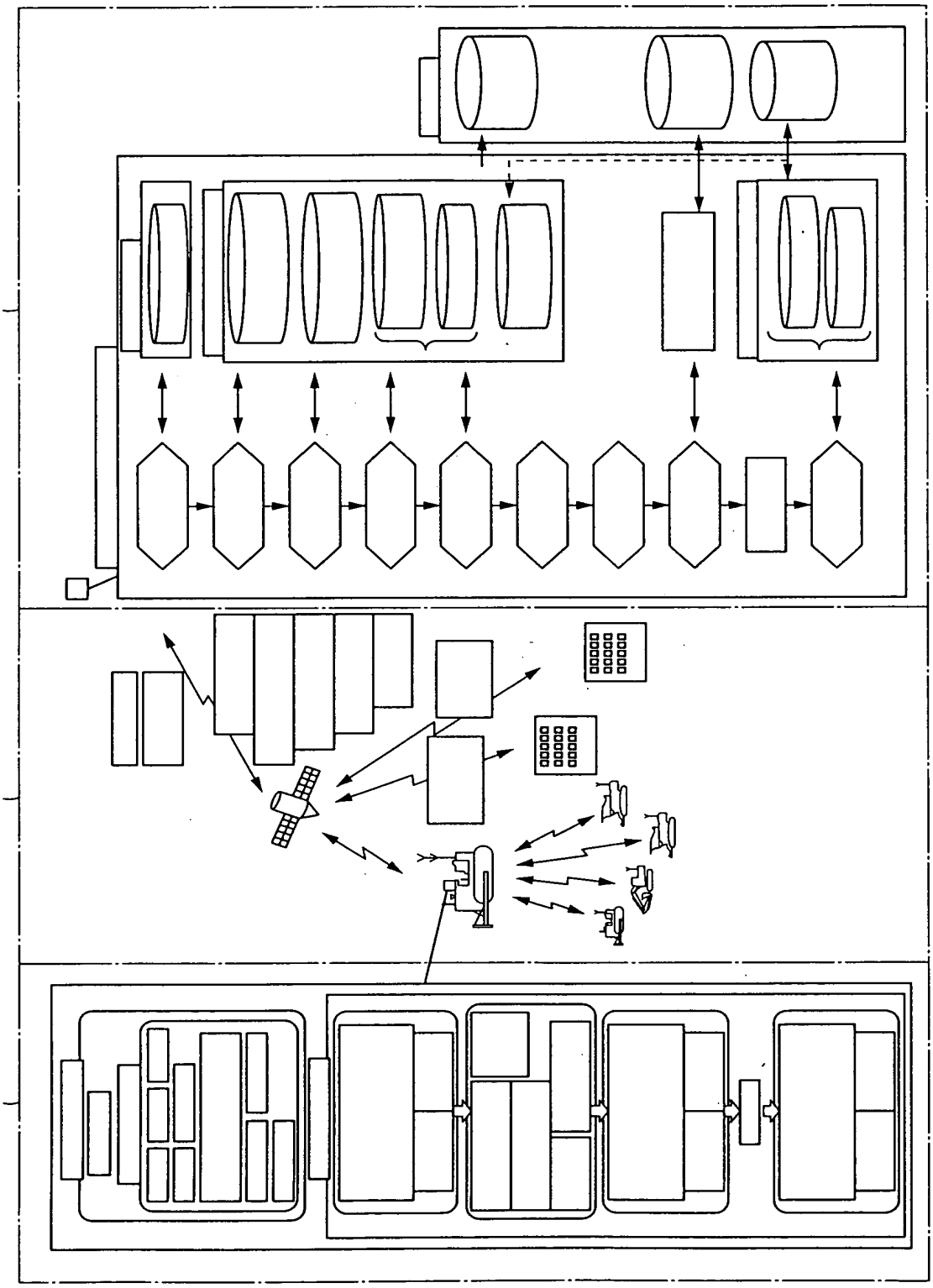
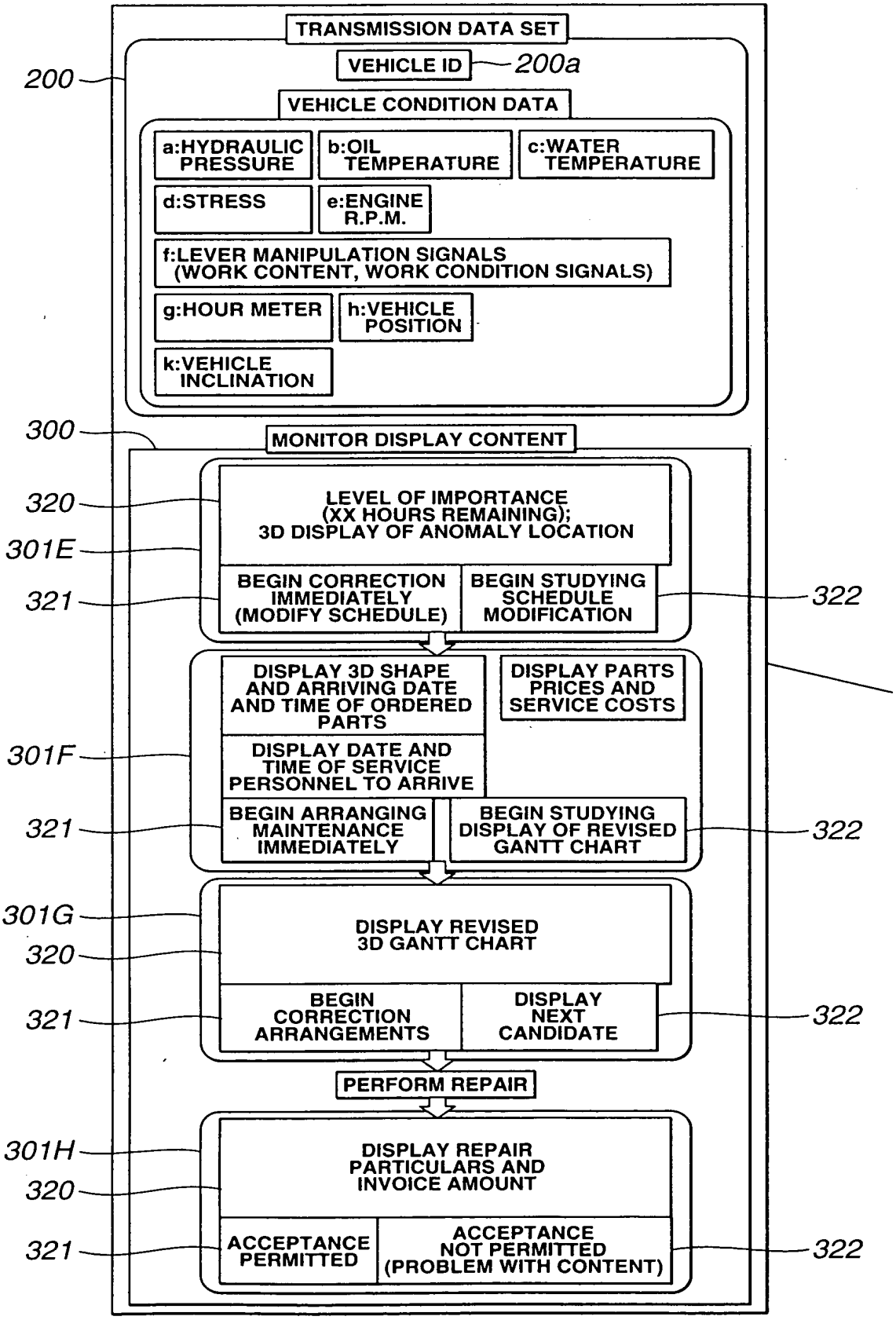

11
PROBLEM AND OPTIMAL MAINTENANCE JUDGMENT SYSTEM
MODEL JUDGMENT SYSTEM
SPECIFY MACHINE TYPE AND MODEL TO COMPARE
401
MACHINE TYPE AND MODEL SPECIFIC MACHINE NUMBER DATABASE
160
NORMAL/ ANOMALOUS
402
PROBLEM JUDGMENT AND SPECIFICATION SYSTEM
NORMAL CONDITION DATA DATABASE
151
DECIDE WHETHER OR NOT CONTINUED USE POSSIBLE
403
CRITICAL TIME DATA DATABASE
156
SPECIFY AND DISPLAY MAINTENANCE LOCATION
404
157
140A
MAINTENANCE FAILURE FATALITY LEVEL DATABASE
30A COMPANY DATABASE
JUDGE WHETHER OR NOT USER HAS PARTS IN INVENTORY
405
3D PARTS SHAPE DATABASE
30A COMPANY PARTS INVENTORY DATABASE
SEARCH PARTS INVENTORY
406
161
REQUIRED MAINTENANCE TIME DATA DATABASE
143A
141A
SEARCH SERVICE PERSONNEL AND COSTS
407
158
110
30A COMPANY 3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
REVISE 3D GANTT CHART
408
CONSTRUCTION WORK SPECIFIC OPTIMIZED 3D GANTT CHART PRODUCTION SYSTEM
ARRANGE PARTS AND SERVICE PERSONNEL; PERFORM REPAIR
409
SERVICE RELATED FEE COLLECTION SYSTEM
132
MACHINE-SPECIFIC PARTS PRICE DATABASE
30A COMPANY SERVICE HISTORY DATABASE
INVOICE FOR COSTS
410
SERVICE FEE DATABASE
142A
131

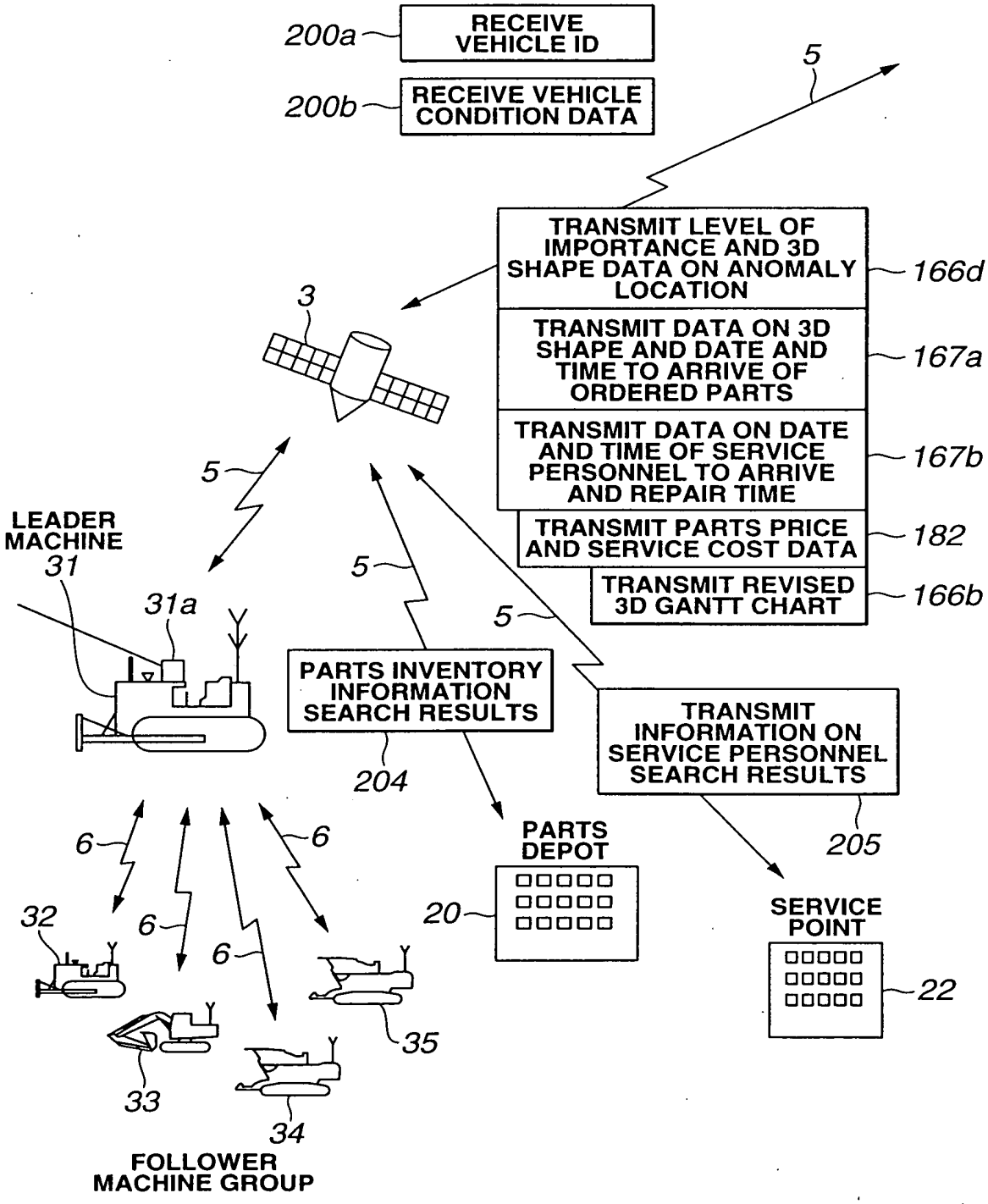
FIG.6



(A) OF FIG.6


TRANSMISSION DATA SET
VEHICLE ID
200a
200
VEHICLE CONDITION DATA
a:HYDRAULIC PRESSURE
b:OIL TEMPERATURE
c:WATER TEMPERATURE
d:STRESS
e:ENGINE R.P.M.
f:LEVER MANIPULATION SIGNALS (WORK CONTENT, WORK CONDITION SIGNALS)
g:HOUR METER
h:VEHICLE POSITION
k:VEHICLE INCLINATION
300
MONITOR DISPLAY CONTENT
320
LEVEL OF IMPORTANCE (XX HOURS REMAINING); 3D DISPLAY OF ANOMALY LOCATION
301E
321
BEGIN CORRECTION IMMEDIATELY (MODIFY SCHEDULE)
BEGIN STUDYING SCHEDULE MODIFICATION
322
DISPLAY 3D SHAPE AND ARRIVING DATE AND TIME OF ORDERED PARTS
DISPLAY PARTS PRICES AND SERVICE COSTS
301F
DISPLAY DATE AND TIME OF SERVICE PERSONNEL TO ARRIVE
321
BEGIN ARRANGING MAINTENANCE IMMEDIATELY
BEGIN STUDYING DISPLAY OF REVISED GANTT CHART
322
301G
DISPLAY REVISED 3D GANTT CHART
320
321
BEGIN CORRECTION ARRANGEMENTS
DISPLAY NEXT CANDIDATE
322
PERFORM REPAIR
301H
DISPLAY REPAIR PARTICULARS AND INVOICE AMOUNT
320
321
ACCEPTANCE PERMITTED
ACCEPTANCE NOT PERMITTED (PROBLEM WITH CONTENT)
322

(B) OF FIG.6


200a
RECEIVE VEHICLE ID
200b
RECEIVE VEHICLE CONDITION DATA
5
TRANSMIT LEVEL OF IMPORTANCE AND 3D SHAPE DATA ON ANOMALY LOCATION
166d
TRANSMIT DATA ON 3D SHAPE AND DATE AND TIME TO ARRIVE OF ORDERED PARTS
167a
TRANSMIT DATA ON DATE AND TIME OF SERVICE PERSONNEL TO ARRIVE AND REPAIR TIME
167b
TRANSMIT PARTS PRICE AND SERVICE COST DATA
182
TRANSMIT REVISED 3D GANTT CHART
166b
3
LEADER MACHINE
31
31a
PARTS INVENTORY INFORMATION SEARCH RESULTS
204
TRANSMIT INFORMATION ON SERVICE PERSONNEL SEARCH RESULTS
205
PARTS DEPOT
20
SERVICE POINT
22
6
32
33
34
35
FOLLOWER MACHINE GROUP

(C) OF FIG.6

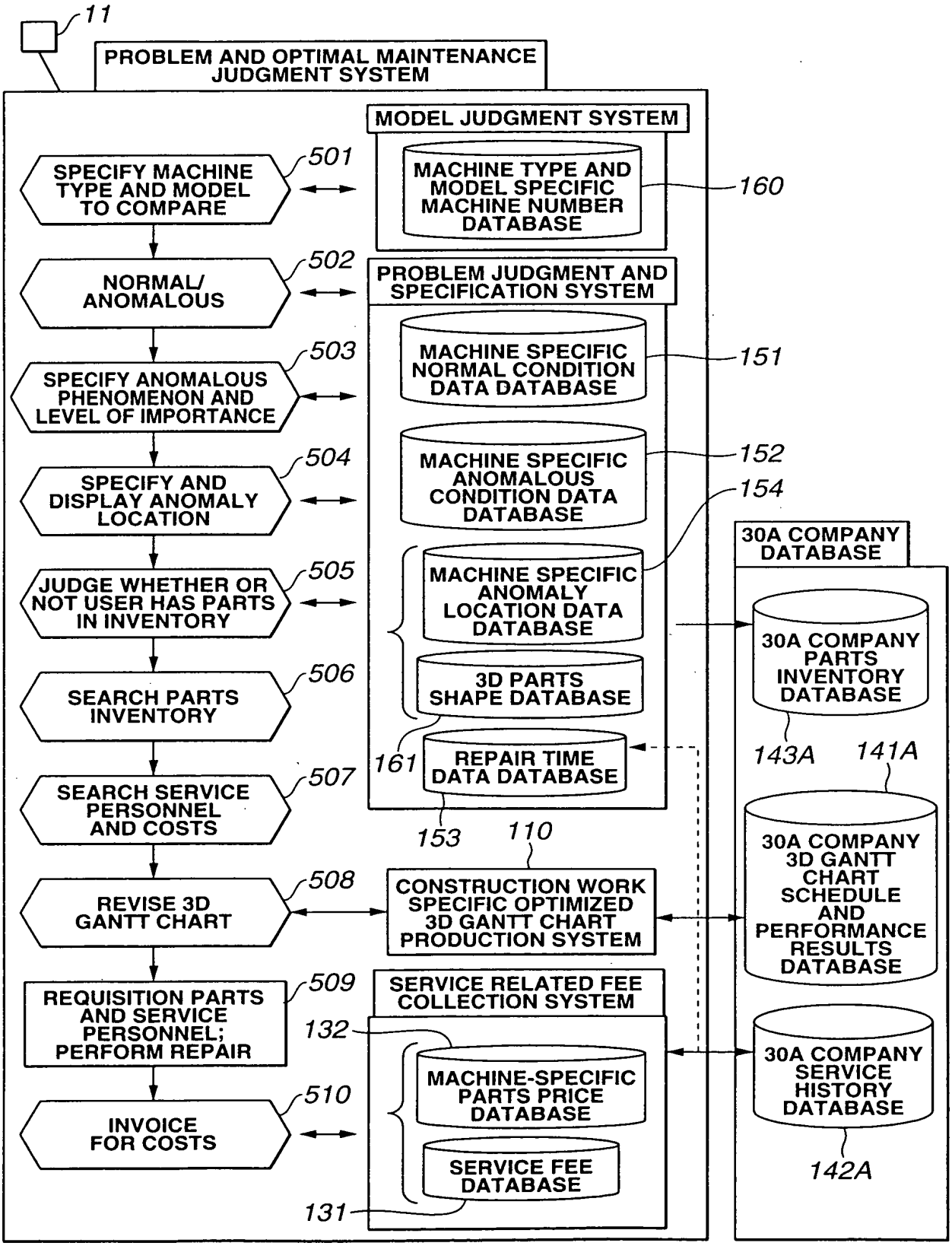
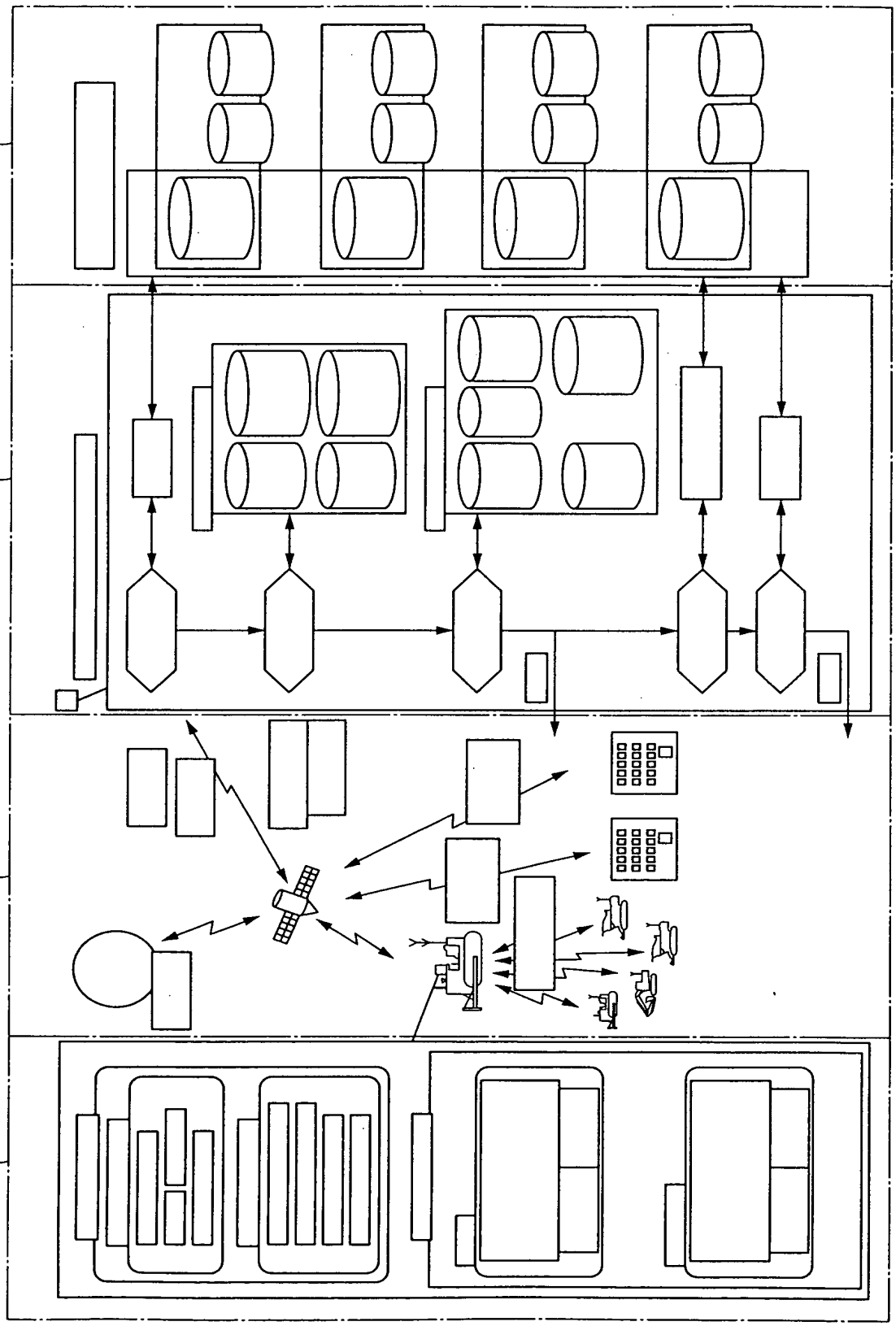
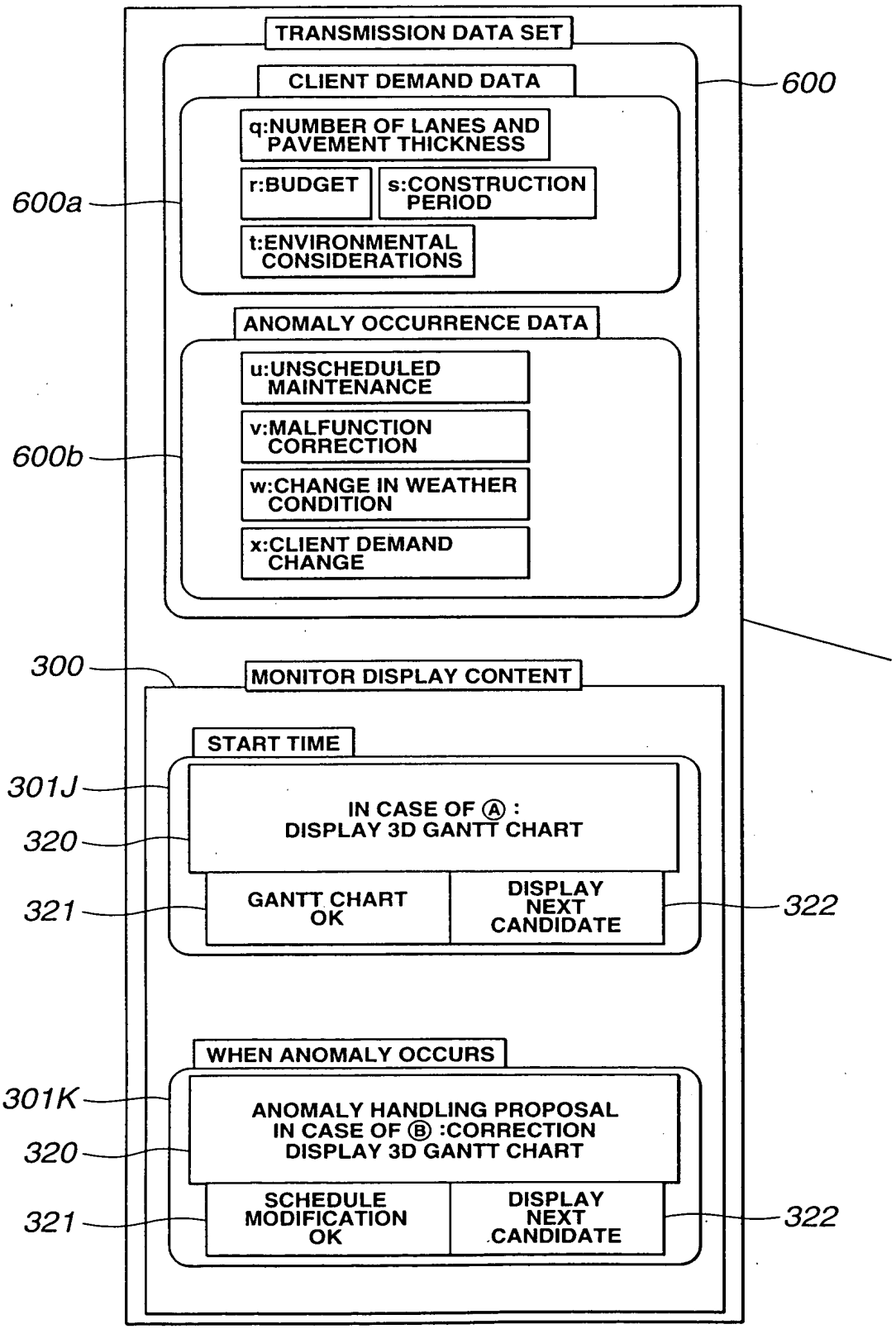

11
PROBLEM AND OPTIMAL MAINTENANCE JUDGMENT SYSTEM
MODEL JUDGMENT SYSTEM
MACHINE TYPE AND MODEL SPECIFIC MACHINE NUMBER DATABASE
160
501
SPECIFY MACHINE TYPE AND MODEL TO COMPARE
502
NORMAL/ ANOMALOUS
PROBLEM JUDGMENT AND SPECIFICATION SYSTEM
503
SPECIFY ANOMALOUS PHENOMENON AND LEVEL OF IMPORTANCE
MACHINE SPECIFIC NORMAL CONDITION DATA DATABASE
151
504
SPECIFY AND DISPLAY ANOMALY LOCATION
MACHINE SPECIFIC ANOMALOUS CONDITION DATA DATABASE
152
154
505
JUDGE WHETHER OR NOT USER HAS PARTS IN INVENTORY
MACHINE SPECIFIC ANOMALY LOCATION DATA DATABASE
30A COMPANY DATABASE
506
SEARCH PARTS INVENTORY
3D PARTS SHAPE DATABASE
30A COMPANY PARTS INVENTORY DATABASE
161
REPAIR TIME DATA DATABASE
143A
141A
507
SEARCH SERVICE PERSONNEL AND COSTS
153
110
30A COMPANY 3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
508
REVISE 3D GANTT CHART
CONSTRUCTION WORK SPECIFIC OPTIMIZED 3D GANTT CHART PRODUCTION SYSTEM
509
REQUISITION PARTS AND SERVICE PERSONNEL; PERFORM REPAIR
SERVICE RELATED FEE COLLECTION SYSTEM
132
MACHINE-SPECIFIC PARTS PRICE DATABASE
30A COMPANY SERVICE HISTORY DATABASE
510
INVOICE FOR COSTS
SERVICE FEE DATABASE
131
142A

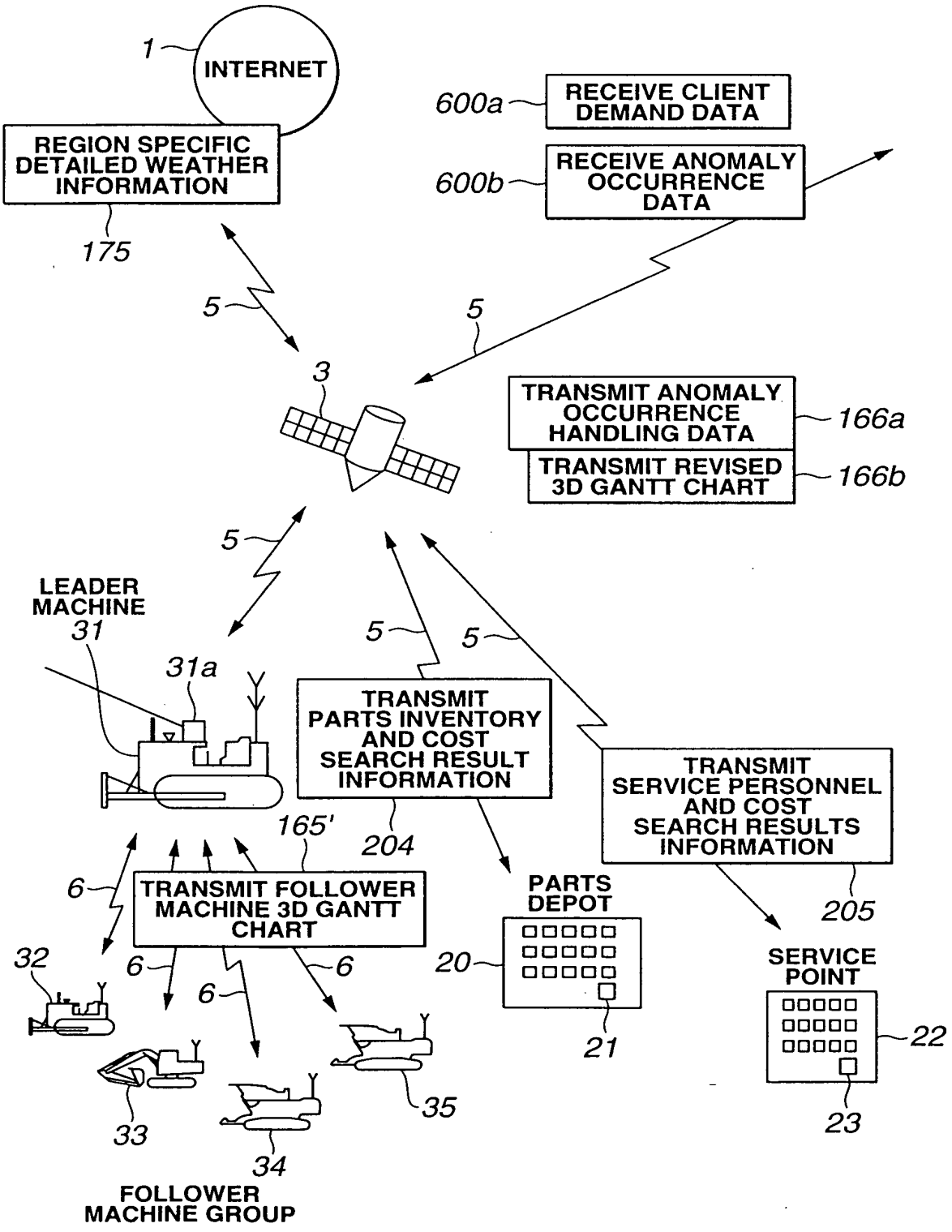
FIG.7



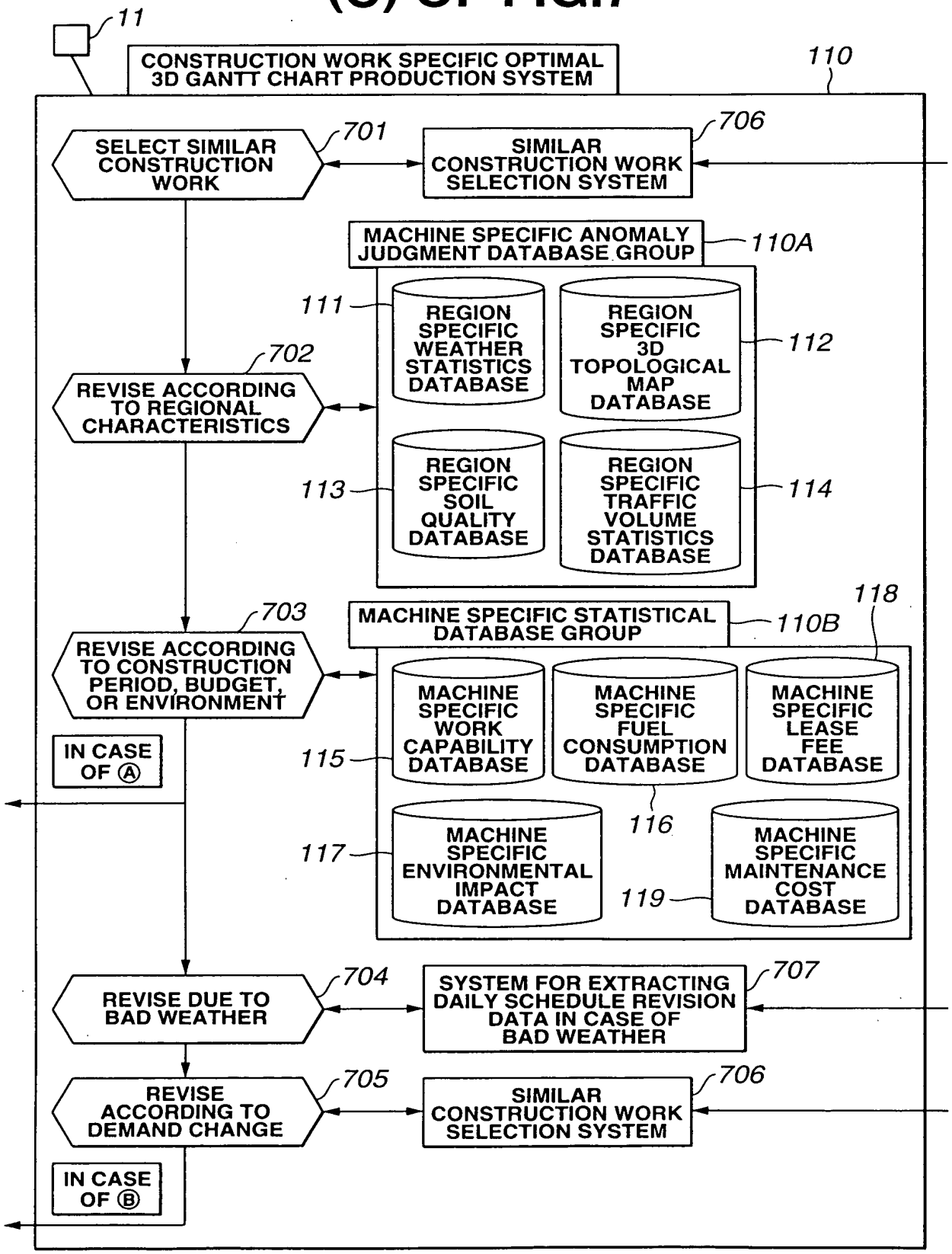
(A) OF FIG.7


TRANSMISSION DATA SET
CLIENT DEMAND DATA
600
q:NUMBER OF LANES AND PAVEMENT THICKNESS
600a
r:BUDGET
s:CONSTRUCTION PERIOD
t:ENVIRONMENTAL CONSIDERATIONS
ANOMALY OCCURRENCE DATA
u:UNSCHEDULED MAINTENANCE
600b
v:MALFUNCTION CORRECTION
w:CHANGE IN WEATHER CONDITION
x:CLIENT DEMAND CHANGE
300
MONITOR DISPLAY CONTENT
START TIME
301J
IN CASE OF Ⓐ : DISPLAY 3D GANTT CHART
320
321
GANTT CHART OK
DISPLAY NEXT CANDIDATE
322
WHEN ANOMALY OCCURS
301K
ANOMALY HANDLING PROPOSAL IN CASE OF Ⓑ :CORRECTION DISPLAY 3D GANTT CHART
320
321
SCHEDULE MODIFICATION OK
DISPLAY NEXT CANDIDATE
322

(B) OF FIG.7


1
INTERNET
REGION SPECIFIC DETAILED WEATHER INFORMATION
175
600a
RECEIVE CLIENT DEMAND DATA
600b
RECEIVE ANOMALY OCCURRENCE DATA
5
5
3
TRANSMIT ANOMALY OCCURRENCE HANDLING DATA
166a
TRANSMIT REVISED 3D GANTT CHART
166b
5
LEADER MACHINE
31
31a
5
5
TRANSMIT PARTS INVENTORY AND COST SEARCH RESULT INFORMATION
TRANSMIT SERVICE PERSONNEL AND COST SEARCH RESULTS INFORMATION
165'
204
205
6
TRANSMIT FOLLOWER MACHINE 3D GANTT CHART
PARTS DEPOT
20
21
SERVICE POINT
22
23
32
6
6
6
33
34
35
FOLLOWER MACHINE GROUP

(C) OF FIG.7


11
CONSTRUCTION WORK SPECIFIC OPTIMAL 3D GANTT CHART PRODUCTION SYSTEM
110
SELECT SIMILAR CONSTRUCTION WORK
701
SIMILAR CONSTRUCTION WORK SELECTION SYSTEM
706
MACHINE SPECIFIC ANOMALY JUDGMENT DATABASE GROUP
110A
111
REGION SPECIFIC WEATHER STATISTICS DATABASE
REGION SPECIFIC 3D TOPOLOGICAL MAP DATABASE
112
REVISE ACCORDING TO REGIONAL CHARACTERISTICS
702
113
REGION SPECIFIC SOIL QUALITY DATABASE
REGION SPECIFIC TRAFFIC VOLUME STATISTICS DATABASE
114
118
MACHINE SPECIFIC STATISTICAL DATABASE GROUP
110B
703
REVISE ACCORDING TO CONSTRUCTION PERIOD, BUDGET, OR ENVIRONMENT
MACHINE SPECIFIC WORK CAPABILITY DATABASE
115
MACHINE SPECIFIC FUEL CONSUMPTION DATABASE
MACHINE SPECIFIC LEASE FEE DATABASE
116
IN CASE OF Ⓐ
117
MACHINE SPECIFIC ENVIRONMENTAL IMPACT DATABASE
119
MACHINE SPECIFIC MAINTENANCE COST DATABASE
REVISE DUE TO BAD WEATHER
704
SYSTEM FOR EXTRACTING DAILY SCHEDULE REVISION DATA IN CASE OF BAD WEATHER
707
REVISE ACCORDING TO DEMAND CHANGE
705
SIMILAR CONSTRUCTION WORK SELECTION SYSTEM
706
IN CASE OF Ⓑ

(D) OF FIG.7

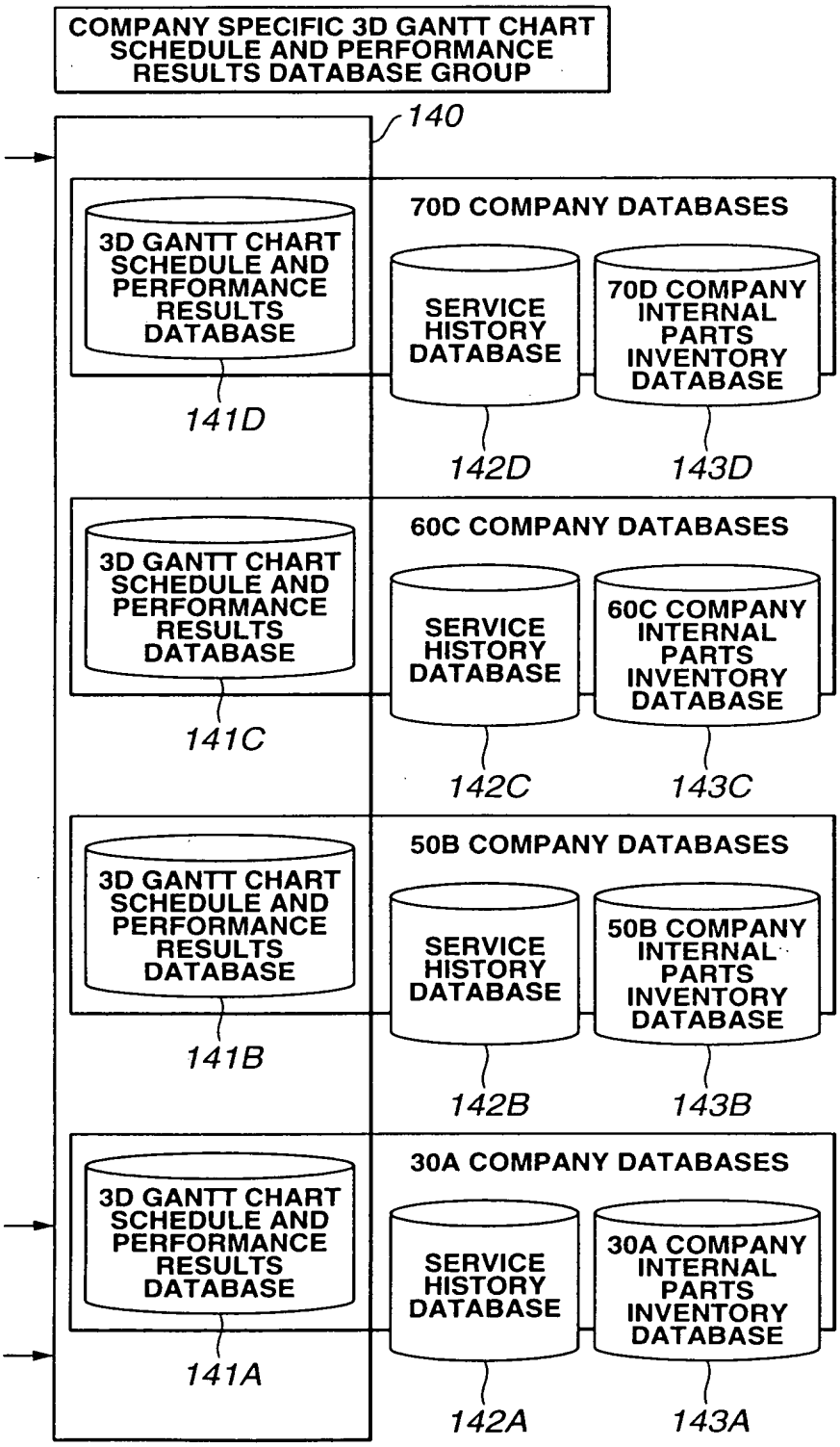
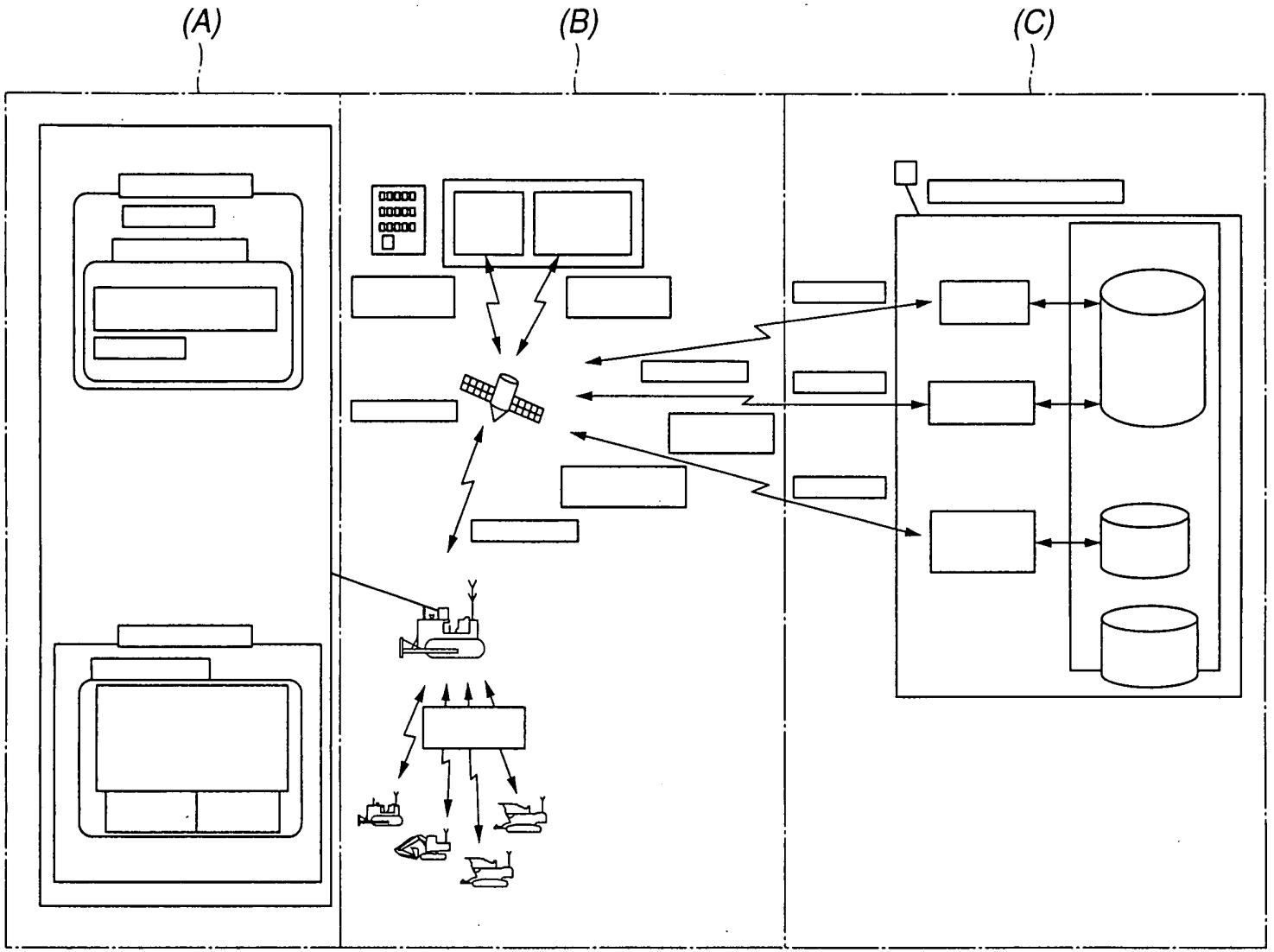
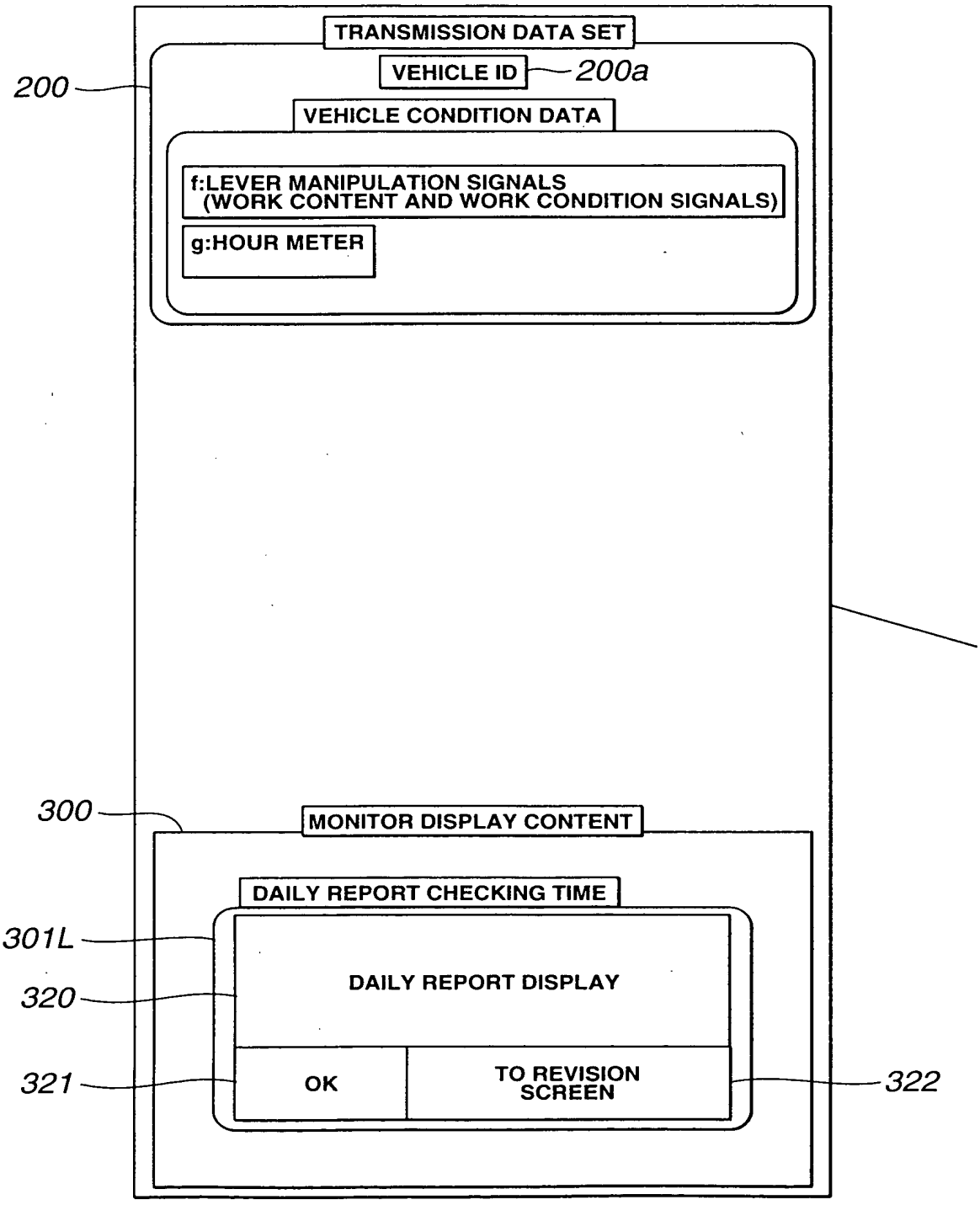

COMPANY SPECIFIC 3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE GROUP
140
70D COMPANY DATABASES
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
SERVICE HISTORY DATABASE
70D COMPANY INTERNAL PARTS INVENTORY DATABASE
141D
142D
143D
60C COMPANY DATABASES
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
SERVICE HISTORY DATABASE
60C COMPANY INTERNAL PARTS INVENTORY DATABASE
141C
142C
143C
50B COMPANY DATABASES
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
SERVICE HISTORY DATABASE
50B COMPANY INTERNAL PARTS INVENTORY DATABASE
141B
142B
143B
30A COMPANY DATABASES
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
SERVICE HISTORY DATABASE
30A COMPANY INTERNAL PARTS INVENTORY DATABASE
141A
142A
143A

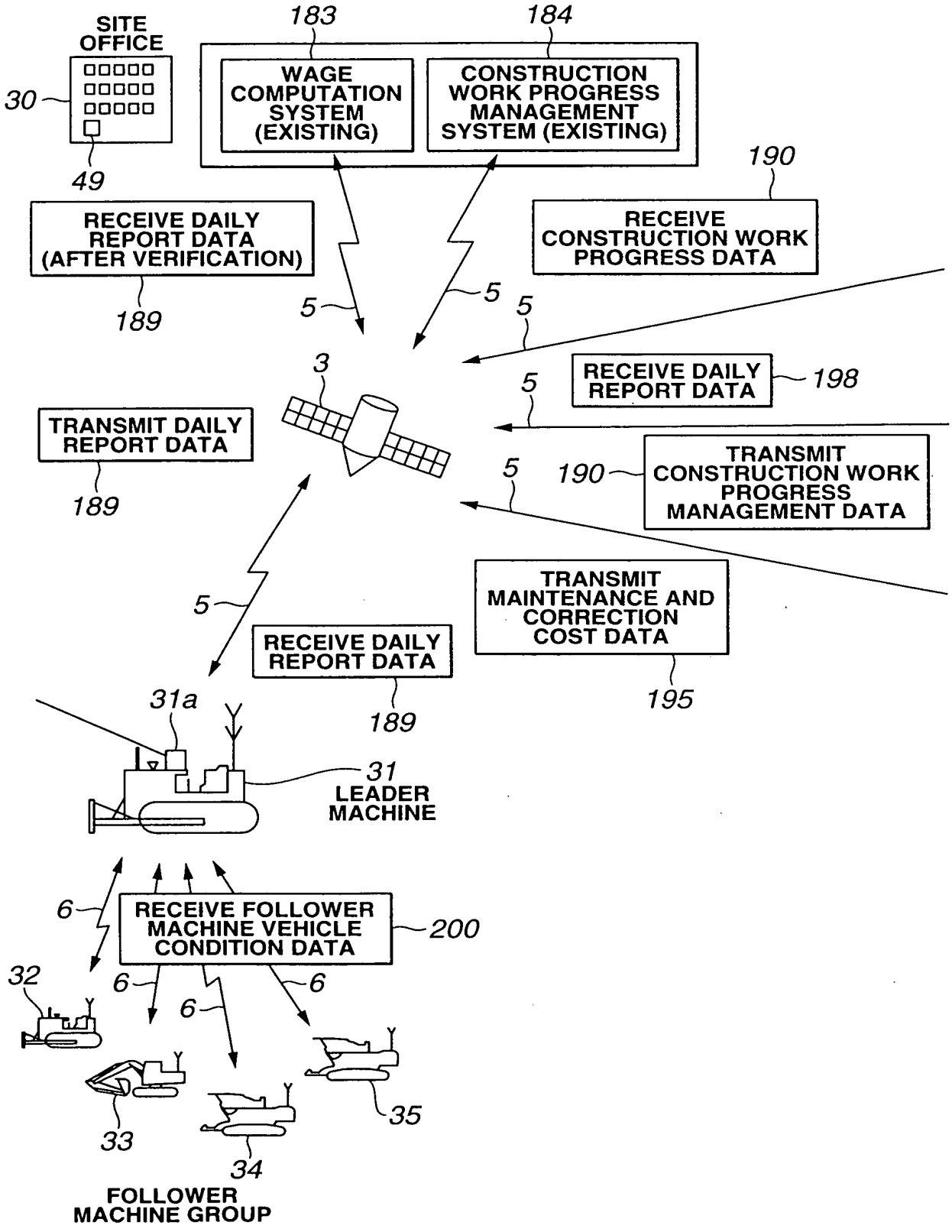
FIG.8



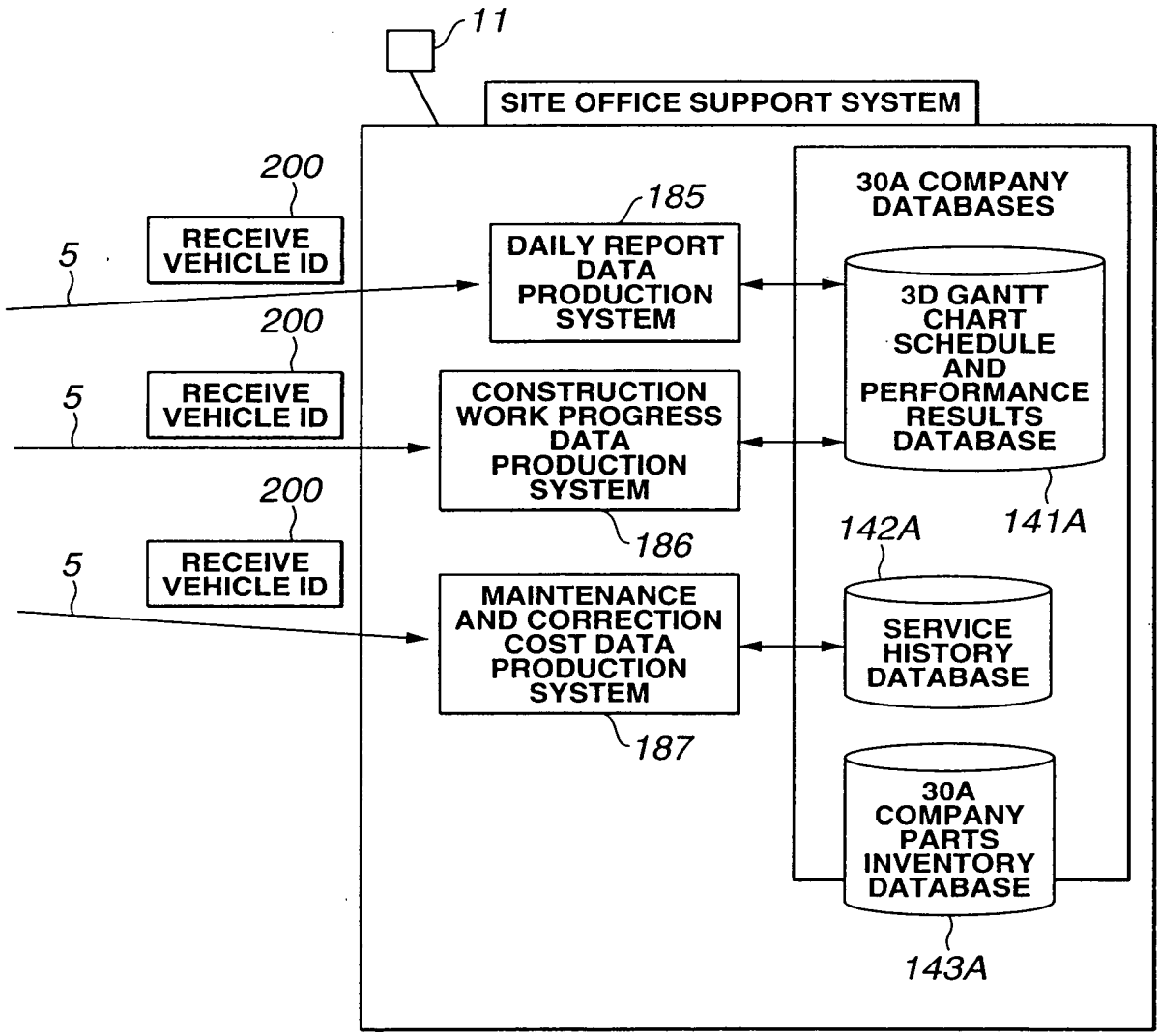
(A) OF FIG.8


TRANSMISSION DATA SET
VEHICLE ID
200a
200
VEHICLE CONDITION DATA
f:LEVER MANIPULATION SIGNALS
(WORK CONTENT AND WORK CONDITION SIGNALS)
g:HOUR METER
300
MONITOR DISPLAY CONTENT
DAILY REPORT CHECKING TIME
301L
DAILY REPORT DISPLAY
320
321
OK
TO REVISION SCREEN
322

(B) OF FIG.8

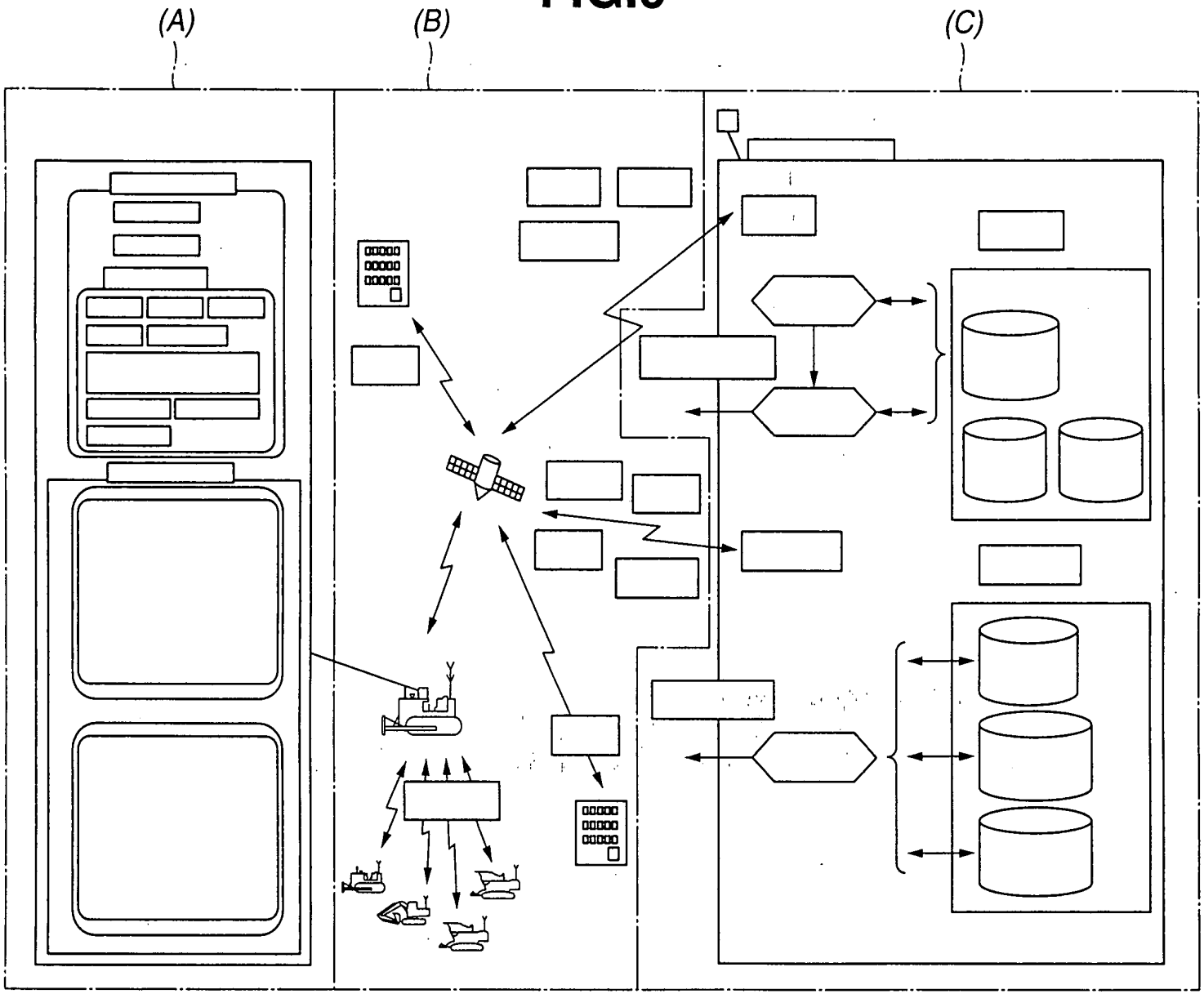

SITE OFFICE
30
49
183
184
WAGE COMPUTATION SYSTEM (EXISTING)
CONSTRUCTION WORK PROGRESS MANAGEMENT SYSTEM (EXISTING)
190
RECEIVE DAILY REPORT DATA (AFTER VERIFICATION)
189
RECEIVE CONSTRUCTION WORK PROGRESS DATA
5
3
RECEIVE DAILY REPORT DATA
198
TRANSMIT DAILY REPORT DATA
189
TRANSMIT CONSTRUCTION WORK PROGRESS MANAGEMENT DATA
TRANSMIT MAINTENANCE AND CORRECTION COST DATA
195
RECEIVE DAILY REPORT DATA
189
31a
31
LEADER MACHINE
6
RECEIVE FOLLOWER MACHINE VEHICLE CONDITION DATA
200
32
33
34
35
FOLLOWER MACHINE GROUP

(C) OF FIG.8

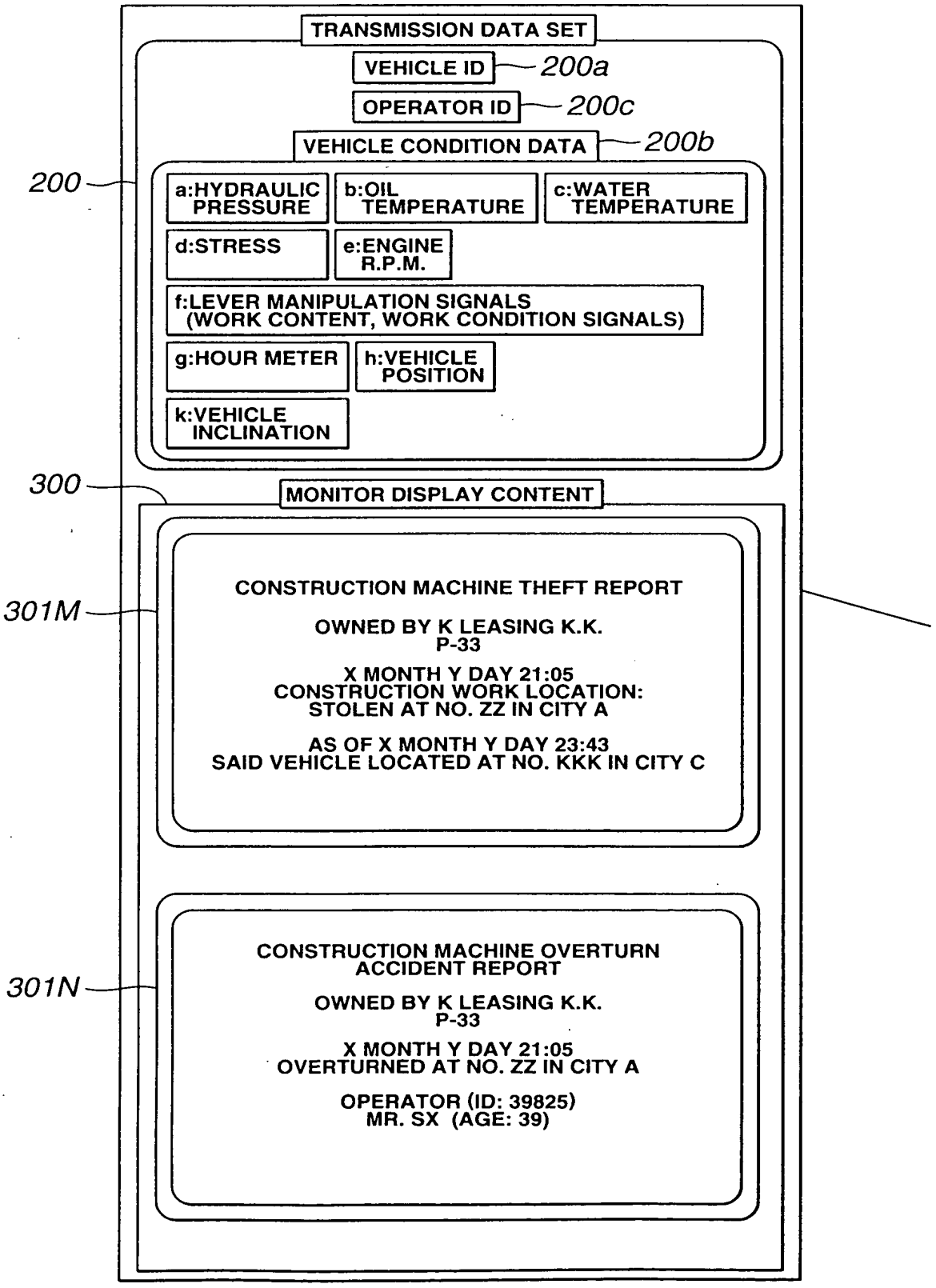

11
SITE OFFICE SUPPORT SYSTEM
200
RECEIVE VEHICLE ID
5
200
RECEIVE VEHICLE ID
5
200
RECEIVE VEHICLE ID
5
185
DAILY REPORT DATA PRODUCTION SYSTEM
CONSTRUCTION WORK PROGRESS DATA PRODUCTION SYSTEM
186
MAINTENANCE AND CORRECTION COST DATA PRODUCTION SYSTEM
187
30A COMPANY DATABASES
3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
141A
142A
SERVICE HISTORY DATABASE
30A COMPANY PARTS INVENTORY DATABASE
143A

JP2002-092660

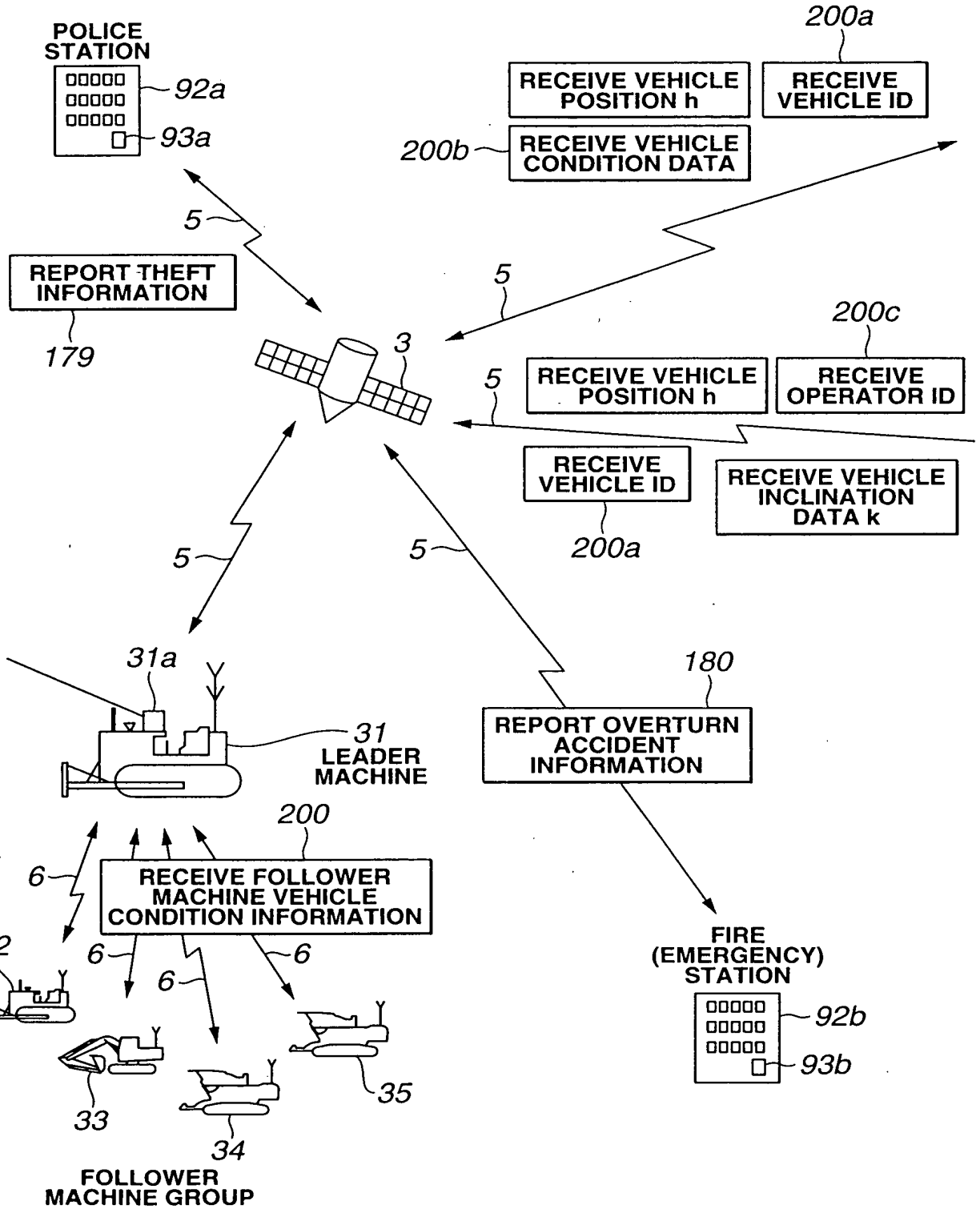
FIG.9



(A) OF FIG.9


TRANSMISSION DATA SET
VEHICLE ID
200a
OPERATOR ID
200c
VEHICLE CONDITION DATA
200b
200
a:HYDRAULIC PRESSURE
b:OIL TEMPERATURE
c:WATER TEMPERATURE
d:STRESS
e:ENGINE R.P.M.
f:LEVER MANIPULATION SIGNALS (WORK CONTENT, WORK CONDITION SIGNALS)
g:HOUR METER
h:VEHICLE POSITION
k:VEHICLE INCLINATION
300
MONITOR DISPLAY CONTENT
301M
CONSTRUCTION MACHINE THEFT REPORT
OWNED BY K LEASING K.K.
P-33
X MONTH Y DAY 21:05
CONSTRUCTION WORK LOCATION:
STOLEN AT NO. ZZ IN CITY A
AS OF X MONTH Y DAY 23:43
SAID VEHICLE LOCATED AT NO. KKK IN CITY C
301N
CONSTRUCTION MACHINE OVERTURN ACCIDENT REPORT
OWNED BY K LEASING K.K.
P-33
X MONTH Y DAY 21:05
OVERTURNED AT NO. ZZ IN CITY A
OPERATOR (ID: 39825)
MR. SX (AGE: 39)

(B) OF FIG.9


POLICE STATION
92a
93a
5
REPORT THEFT INFORMATION
179
3
200a
RECEIVE VEHICLE POSITION h
RECEIVE VEHICLE ID
200b
RECEIVE VEHICLE CONDITION DATA
5
200c
RECEIVE VEHICLE POSITION h
RECEIVE OPERATOR ID
5
RECEIVE VEHICLE ID
200a
RECEIVE VEHICLE INCLINATION DATA k
5
5
31a
31
LEADER MACHINE
180
REPORT OVERTURN ACCIDENT INFORMATION
200
6
RECEIVE FOLLOWER MACHINE VEHICLE CONDITION INFORMATION
32
6
6
6
FIRE (EMERGENCY) STATION
92b
93b
33
34
35
FOLLOWER MACHINE GROUP

(C) OF FIG.9

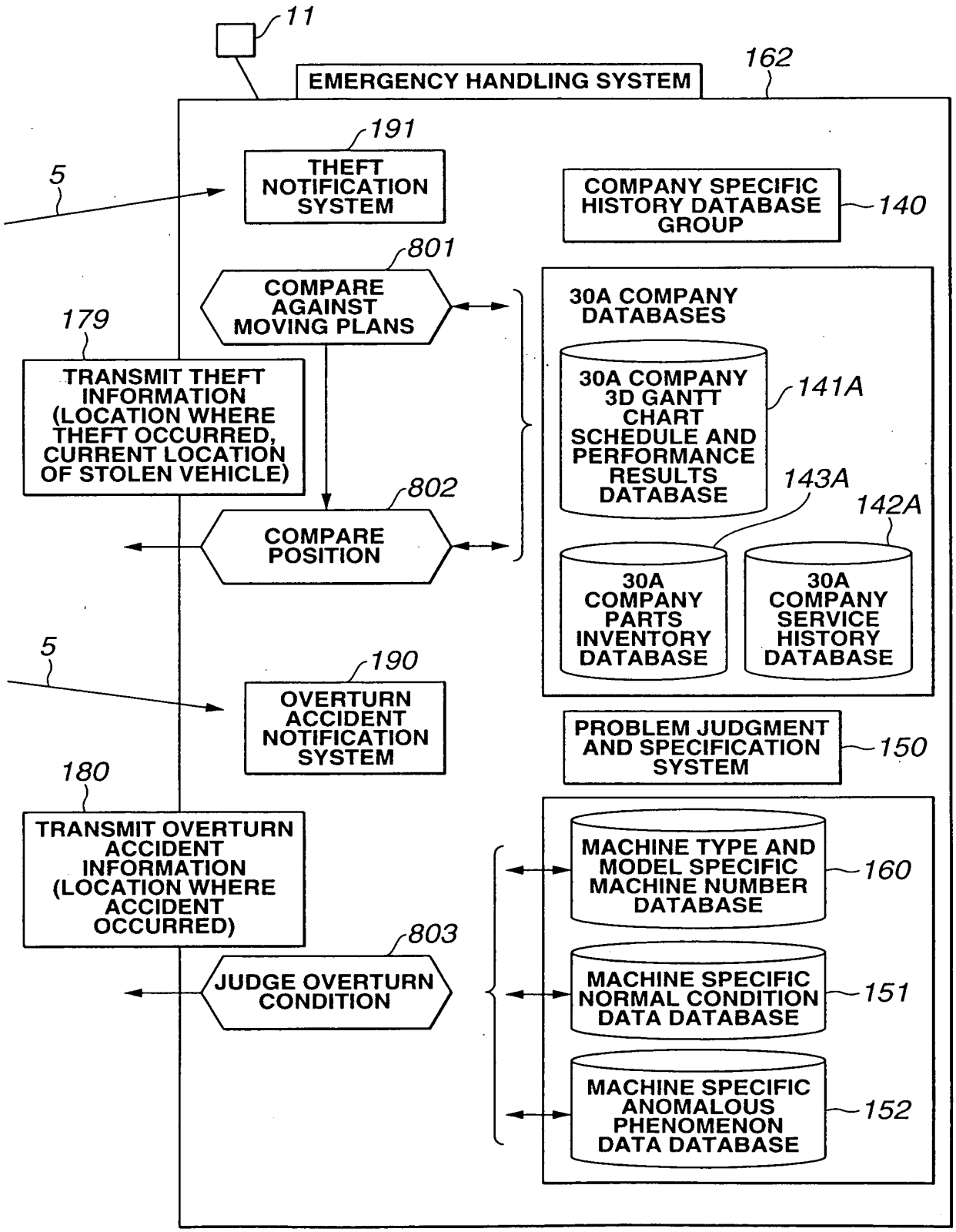
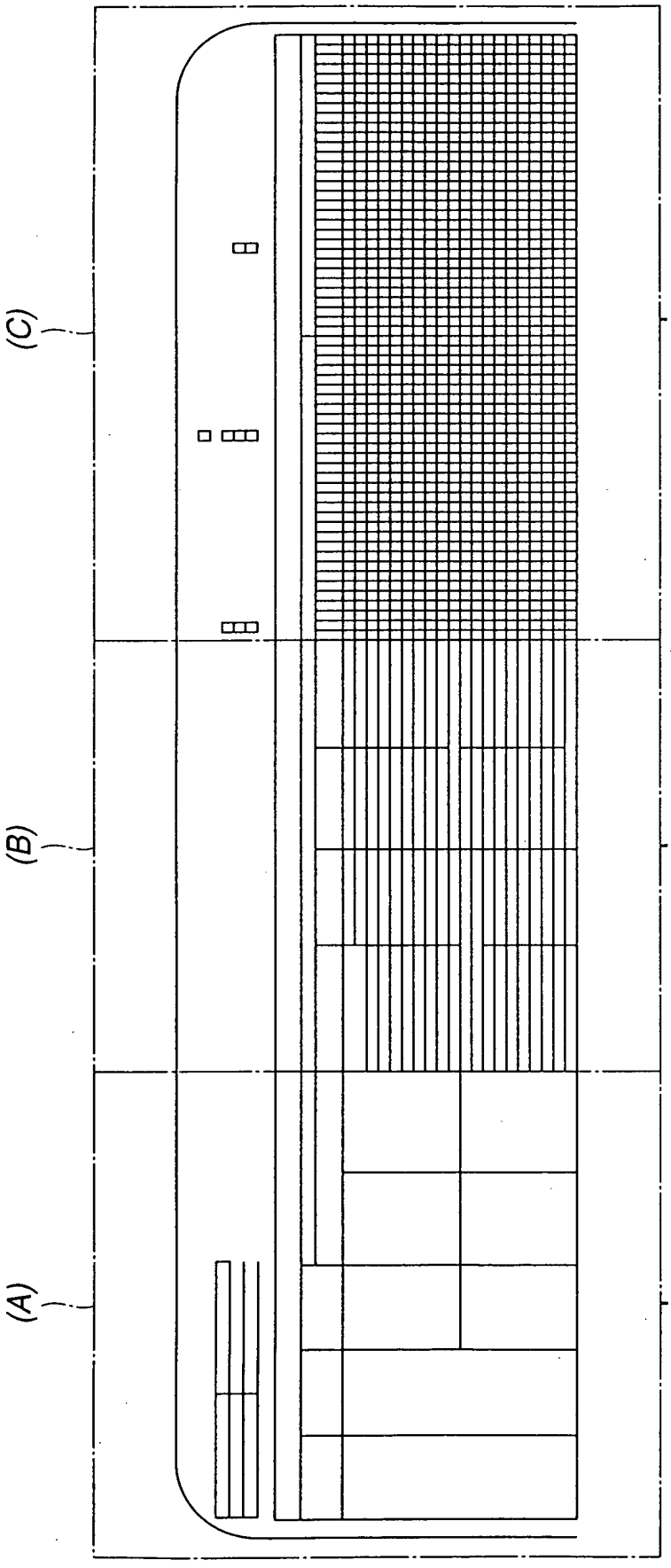

11
EMERGENCY HANDLING SYSTEM
162
191
THEFT NOTIFICATION SYSTEM
5
COMPANY SPECIFIC HISTORY DATABASE GROUP
140
801
COMPARE AGAINST MOVING PLANS
30A COMPANY DATABASES
179
TRANSMIT THEFT INFORMATION (LOCATION WHERE THEFT OCCURRED, CURRENT LOCATION OF STOLEN VEHICLE)
30A COMPANY 3D GANTT CHART SCHEDULE AND PERFORMANCE RESULTS DATABASE
141A
143A
142A
802
COMPARE POSITION
30A COMPANY PARTS INVENTORY DATABASE
30A COMPANY SERVICE HISTORY DATABASE
5
190
OVERTURN ACCIDENT NOTIFICATION SYSTEM
PROBLEM JUDGMENT AND SPECIFICATION SYSTEM
150
180
TRANSMIT OVERTURN ACCIDENT INFORMATION (LOCATION WHERE ACCIDENT OCCURRED)
MACHINE TYPE AND MODEL SPECIFIC MACHINE NUMBER DATABASE
160
803
JUDGE OVERTURN CONDITION
MACHINE SPECIFIC NORMAL CONDITION DATA DATABASE
151
MACHINE SPECIFIC ANOMALOUS PHENOMENON DATA DATABASE
152

FIG.10



(A) OF FIG.10

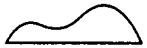
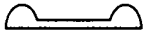
301

TRUNK ROAD CONSTRUCTION WORK BETWEEN CITY A AND CITY B
CONSTRUCTION ZONE X (CITY A, REGION YY) 3D GANTT CHART

CLIENT	NATIONAL GOVERNMENT
CONSTRUCTION PERIOD	FROM XX YEAR X MONTH XX DAY
	TO XX YEAR X MONTH XX DAY

320

CONSTRUCTION ZONE NO.X X MONTH, X+1 MONTH
CONSTRUCTION WORK CONTENT

CONSTRUCTION PHASE	WORK CONTENT	DIVISION	3D TOPOGRAPHY	
			BEFORE STARTING WORK	AT COMPLETION OF WORK
CONSTRUCTION PHASE 1	FOUNDATION CONSTRUCTION WORK (X-1 MONTH CONTINUOUS CONSTRUCTION WORK)	SCHEDULE	 (DIAGRAM OF WHAT IS EXPECTED)	 (DIAGRAM OF WHAT IS EXPECTED)
		PERFORMANCE RESULTS	(PHOTO)	(PHOTO)

(B) OF FIG.10

301

320

CONSTRUCTION WORK DETAILS

MACHINES DEPLOYED	MACHINE NUMBERS	WORK START	WORK COMPLETION
FOR ENTIRE CONSTRUCTION PERIOD	INITIAL PLAN	AUGUST B	AUGUST R
	MODIFIED PLAN	AUGUST B	AUGUST S
D	LEADER MACHINE	AUGUST B	AUGUST S
D	---	AUGUST B	AUGUST P
P	---	AUGUST I	AUGUST S
B	---	AUGUST L	AUGUST S
B	---	AUGUST L	AUGUST S
		REGIONAL WEATHER FORECAST	
FOR ENTIRE CONSTRUCTION PERIOD			
D	31	AUGUST B	AUGUST S
D	32	AUGUST B	AUGUST P
P	33	AUGUST I	AUGUST S
B	34	AUGUST L	AUGUST S
B	35	AUGUST L	AUGUST S
		ACTUAL WEATHER/FORECAST WEATHER	

(C) OF FIG.10

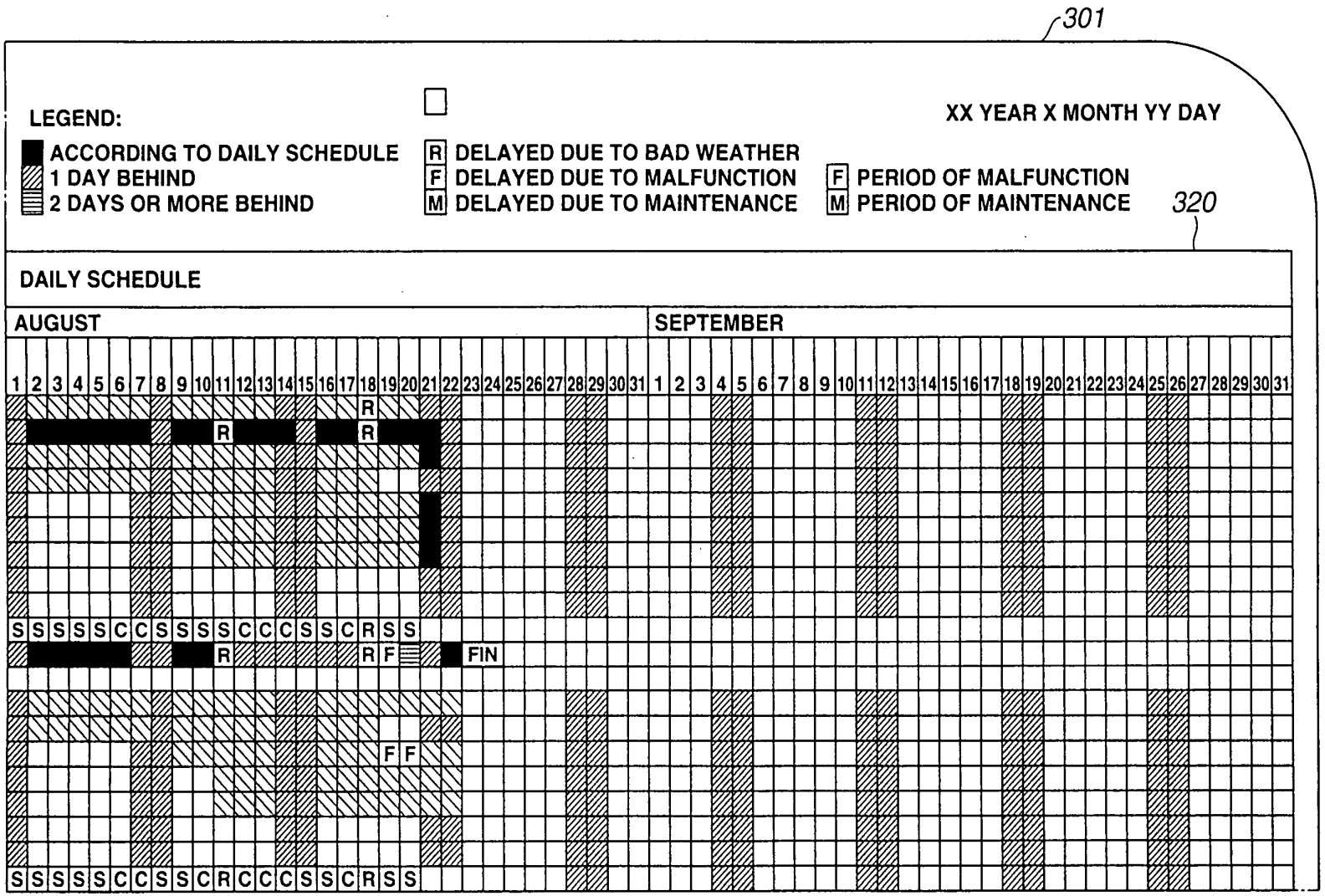
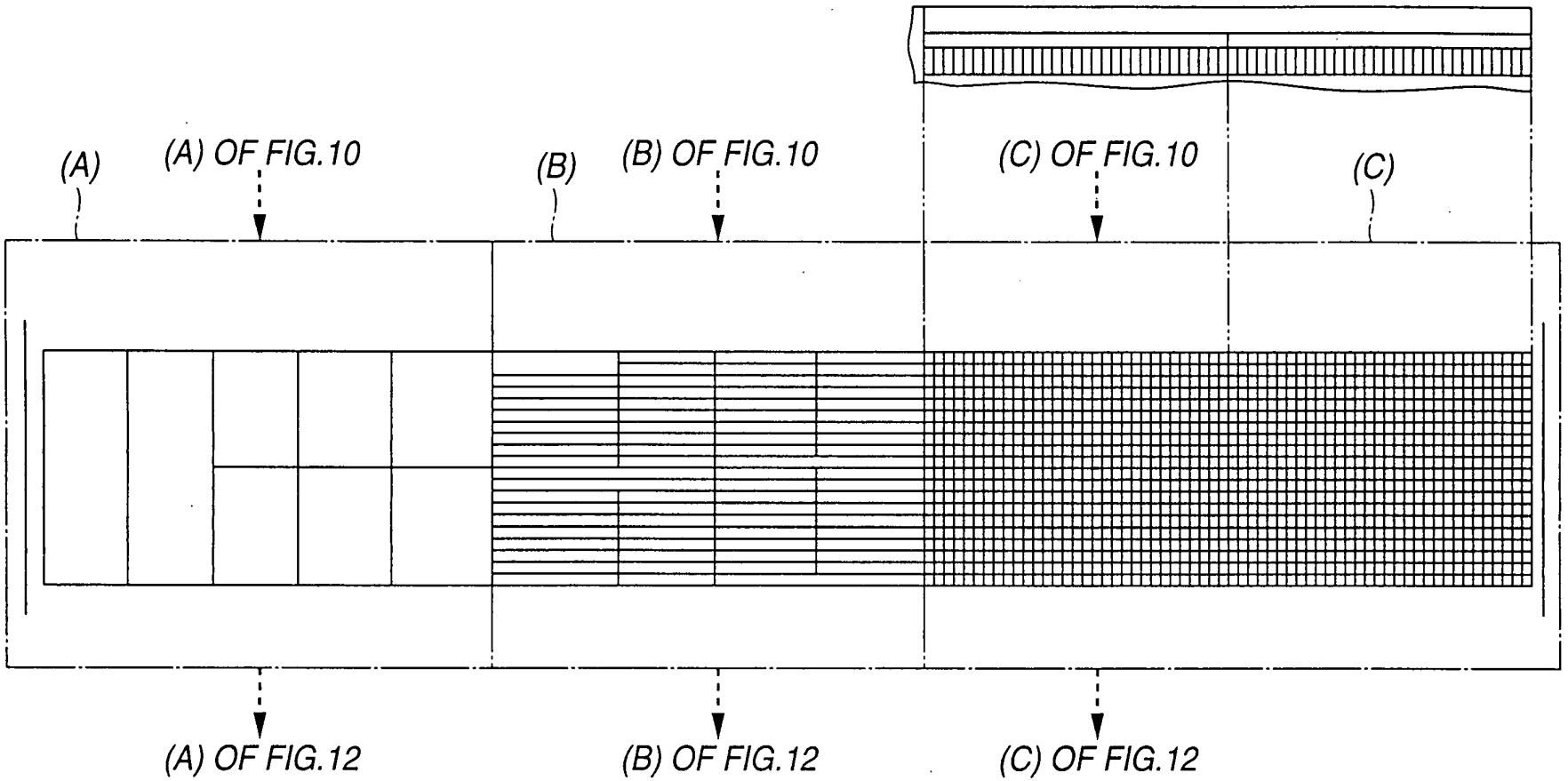
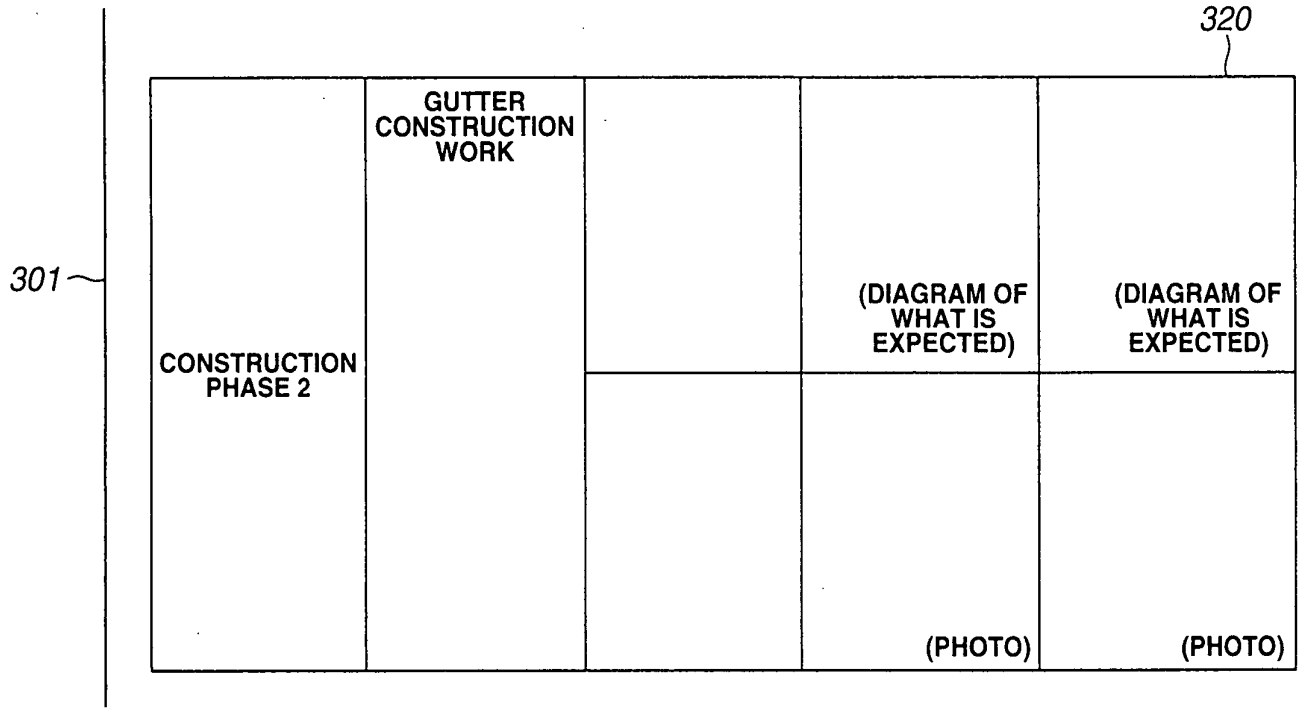

301
LEGEND:
ACCORDING TO DAILY SCHEDULE
1 DAY BEHIND
2 DAYS OR MORE BEHIND
R DELAYED DUE TO BAD WEATHER
F DELAYED DUE TO MALFUNCTION
M DELAYED DUE TO MAINTENANCE
F PERIOD OF MALFUNCTION
M PERIOD OF MAINTENANCE
XX YEAR X MONTH YY DAY
320
DAILY SCHEDULE
AUGUST
SEPTEMBER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
S S S S S C C S S S S C C C S S C R S S
R R R
R R
R F
FIN
F F
S S S S S C C S S C R C C C S S C R S S

FIG.11


(A)
(A) OF FIG.10
(B)
(B) OF FIG.10
(C) OF FIG.10
(C)
(A) OF FIG.12
(B) OF FIG.12
(C) OF FIG.12

(A) OF FIG.11


320
301
CONSTRUCTION PHASE 2
GUTTER CONSTRUCTION WORK
(DIAGRAM OF WHAT IS EXPECTED)
(DIAGRAM OF WHAT IS EXPECTED)
(PHOTO)
(PHOTO)

(B) OF FIG.11

320

FOR ENTIRE CONSTRUCTION PERIOD	INITIAL PLAN	AUGUST Q	AUGUST J
	MODIFIED PLAN	AUGUST R	AUGUST J
P	LEADER MACHINE	AUGUST R	AUGUST J
P	---	AUGUST R	AUGUST J
P	---	AUGUST R	AUGUST J
PU	---	AUGUST Y	AUGUST D
L	---	AUGUST R	AUGUST J
		REGIONAL WEATHER FORECAST	
FOR ENTIRE CONSTRUCTION PERIOD		AUGUST Q	AUGUST J
P	36	AUGUST R	AUGUST J
P	33	AUGUST R	AUGUST J
P	37	AUGUST R	AUGUST J
PU	38	AUGUST Y	AUGUST D
L	39	AUGUST R	AUGUST J
		ACTUAL WEATHER/FORECAST WEATHER	

(C) OF FIG.11

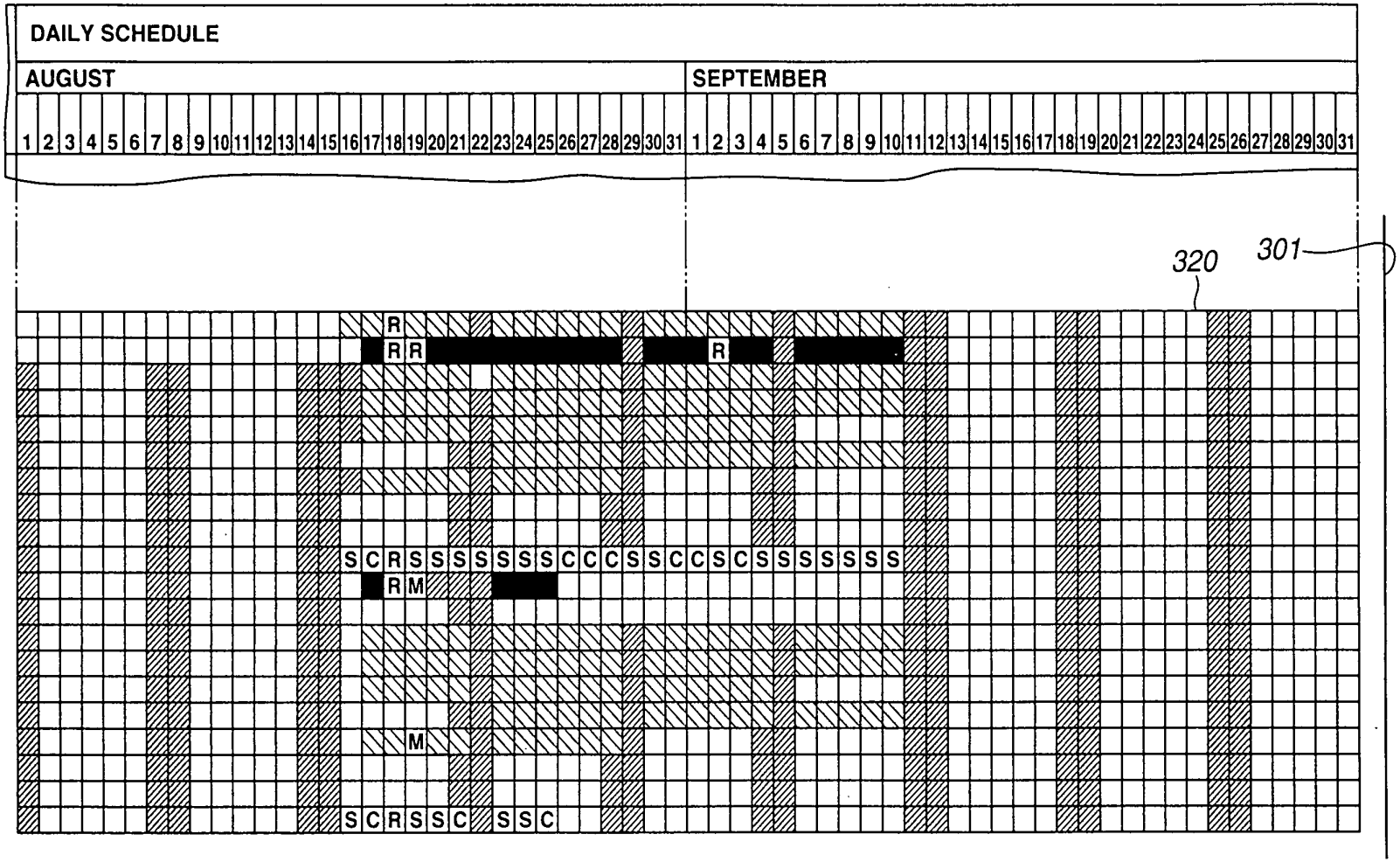
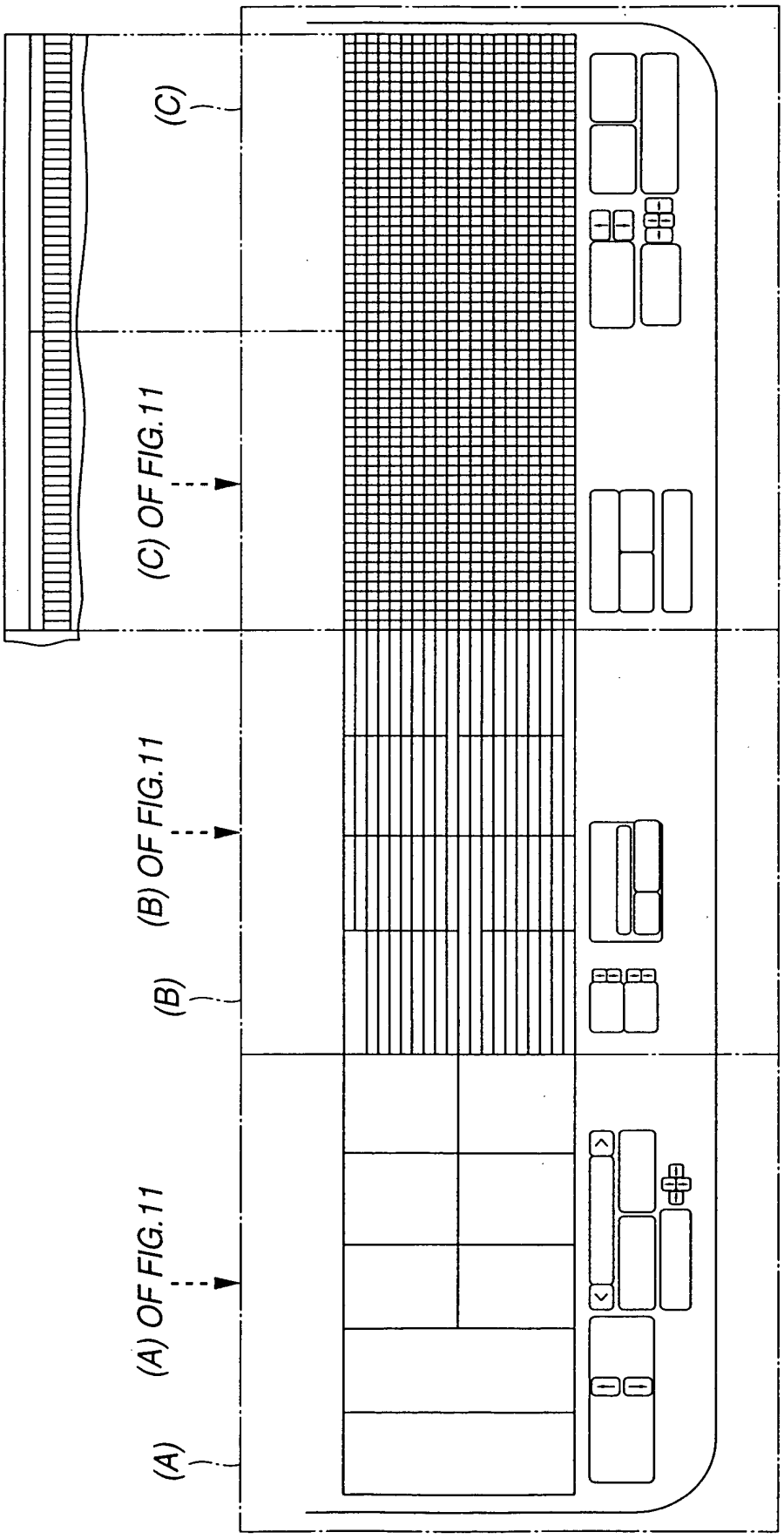
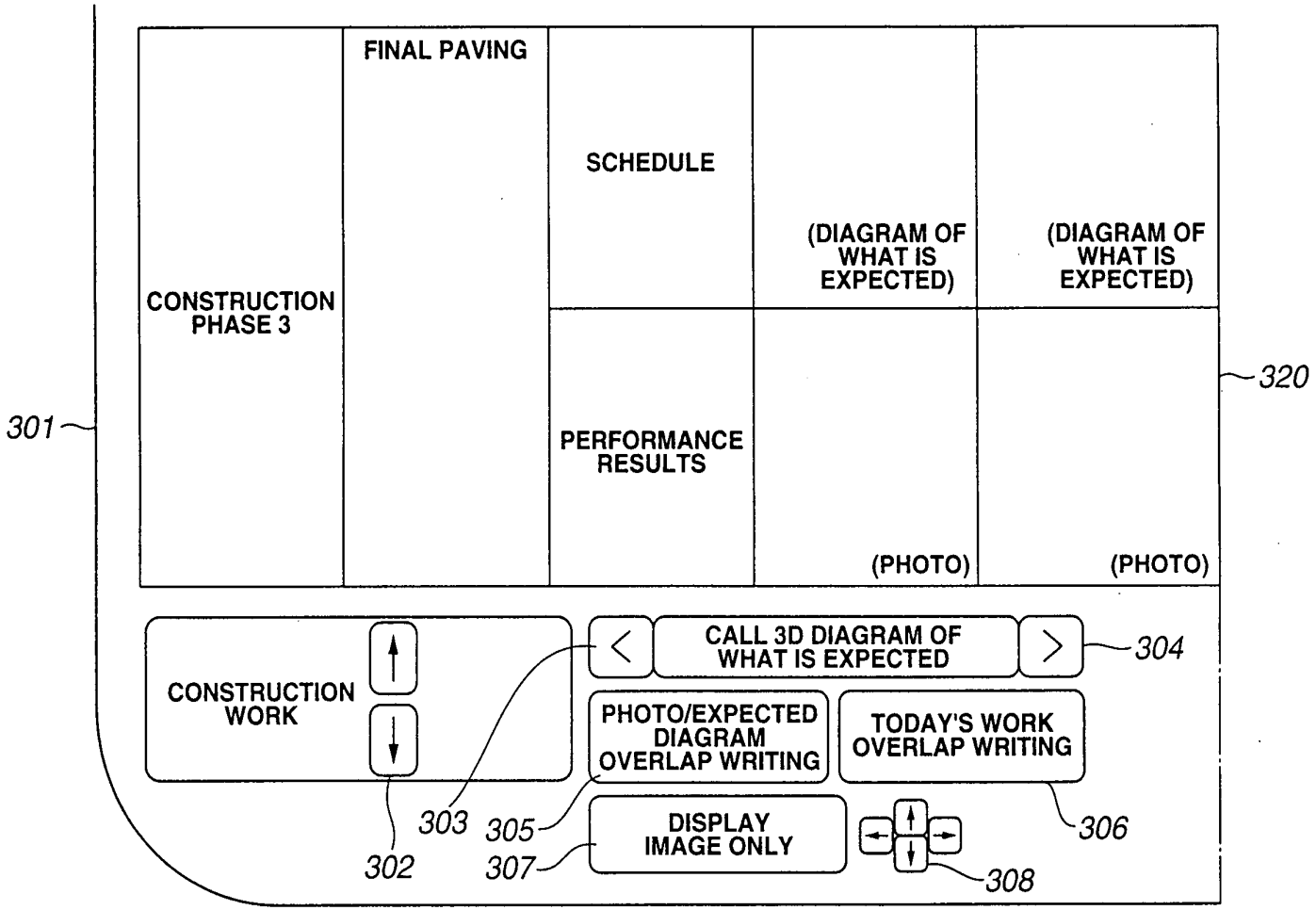

DAILY SCHEDULE
AUGUST
SEPTEMBER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
320
301
R
R R
R
S C R S S S S S S S C C C S S C C S C S S S S S S S
R M
M
S C R S S C S S C

FIG.12



(A) OF FIG.12


CONSTRUCTION PHASE 3
FINAL PAVING
SCHEDULE
(DIAGRAM OF WHAT IS EXPECTED)
(DIAGRAM OF WHAT IS EXPECTED)
PERFORMANCE RESULTS
(PHOTO)
(PHOTO)
301
320
CONSTRUCTION WORK
CALL 3D DIAGRAM OF WHAT IS EXPECTED
304
PHOTO/EXPECTED DIAGRAM OVERLAP WRITING
TODAY'S WORK OVERLAP WRITING
DISPLAY IMAGE ONLY
303
305
306
307
308
302

(B) OF FIG.12

320

FOR ENTIRE CONSTRUCTION PERIOD	INITIAL PLAN	AUGUST F	AUGUST Z
	MODIFIED PLAN		
P	LEADER MACHINE	AUGUST F	AUGUST Z
G	- - -	AUGUST F	AUGUST Z
J	- - -	AUGUST F	AUGUST Z
		REGIONAL WEATHER FORECAST	
FOR ENTIRE CONSTRUCTION PERIOD			
P	33		
G	40		
J	41		
		ACTUAL WEATHER/FORECAST WEATHER	

CHANGE MACHINE

CHANGE MACHINE NUMBER

309

310

ENTER PERFORMANCE RESULTS

ACCORDING TO PLAN

1 DAY BEHIND

2 OR MORE DAYS BEHIND

311

301

(C) OF FIG.12

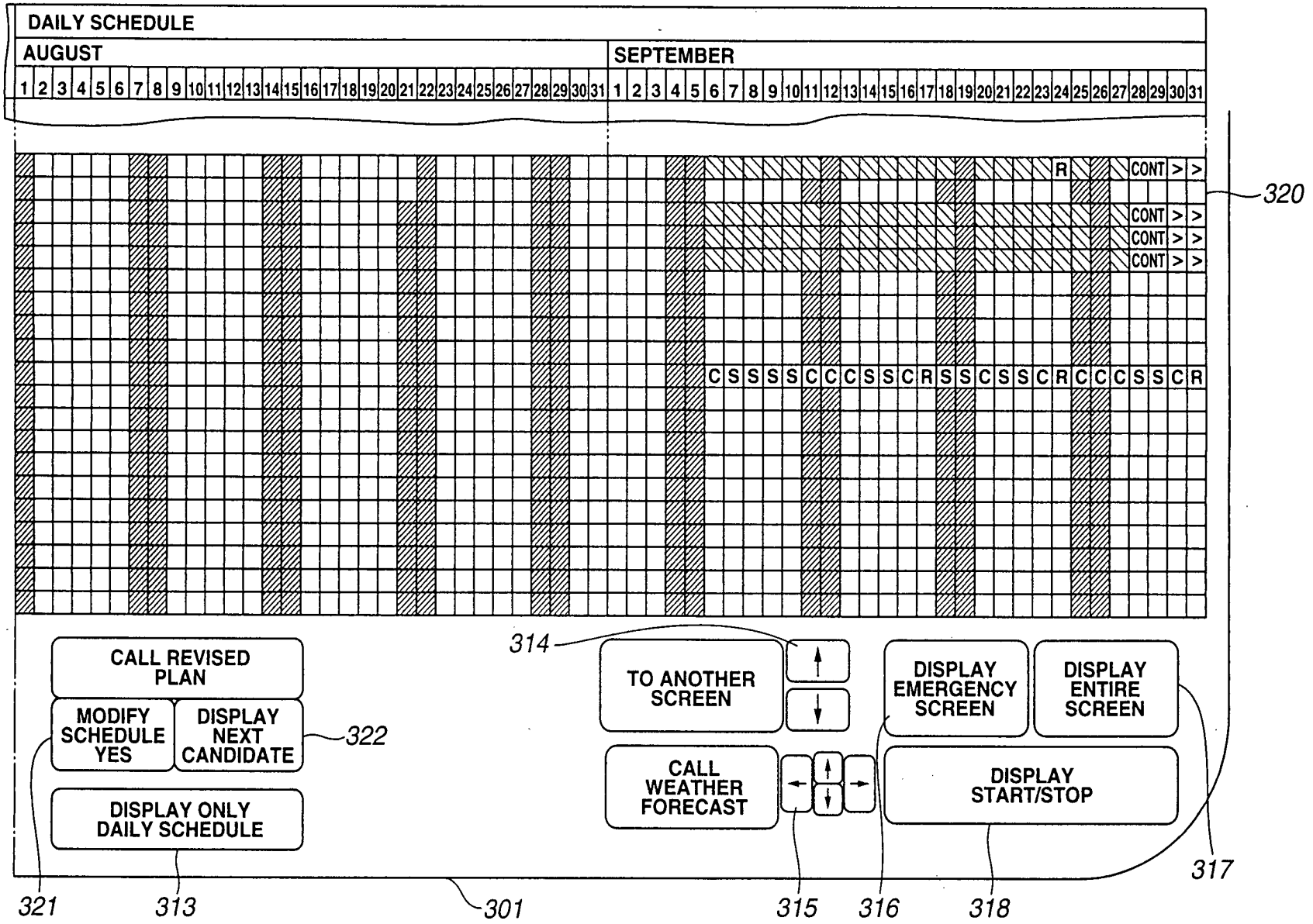

DAILY SCHEDULE
AUGUST
SEPTEMBER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
CONT > >
CONT > >
CONT > >
CONT > >
C S S S S C C C S S C R S S C S S C R C C C S S C R
320
CALL REVISED PLAN
MODIFY SCHEDULE YES
DISPLAY NEXT CANDIDATE
322
DISPLAY ONLY DAILY SCHEDULE
314
TO ANOTHER SCREEN
CALL WEATHER FORECAST
DISPLAY EMERGENCY SCREEN
DISPLAY ENTIRE SCREEN
DISPLAY START/STOP
317
321
313
301
315
316
318

FIG.13

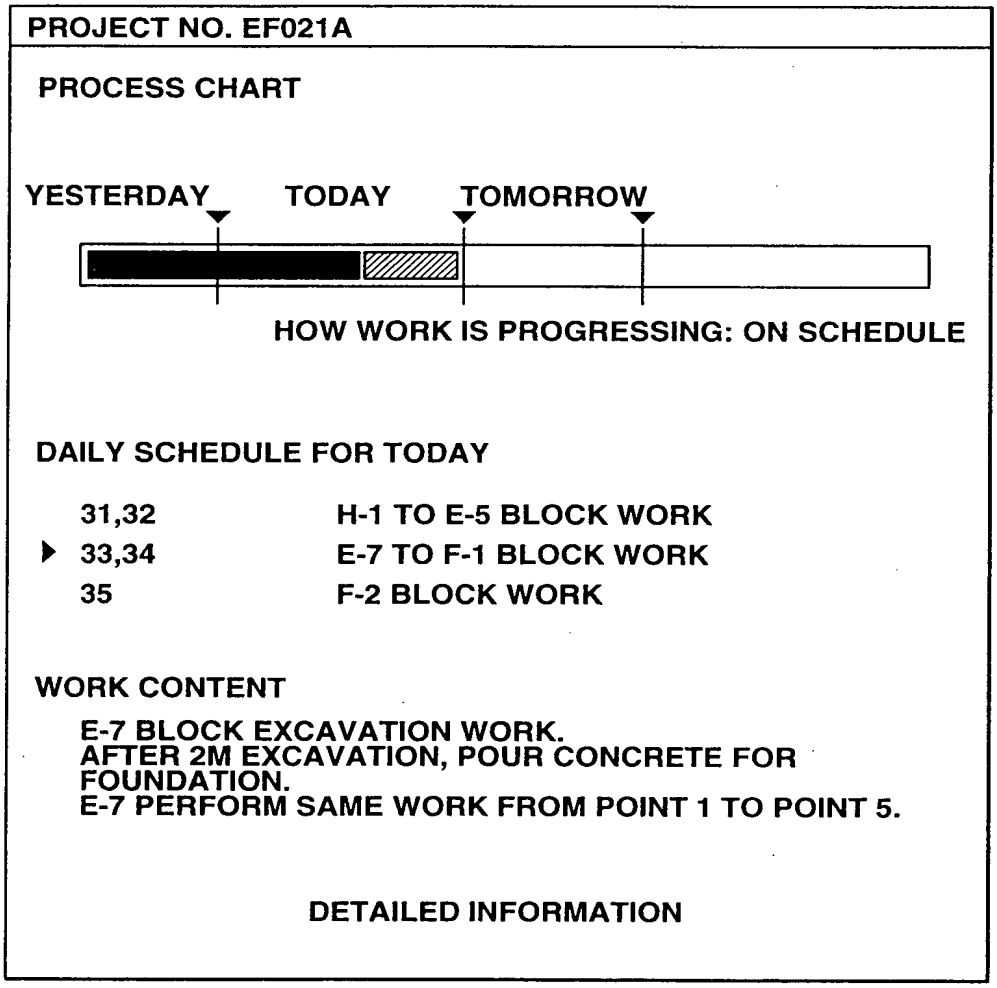

PROJECT NO. EF021A
PROCESS CHART
YESTERDAY
TODAY
TOMORROW
HOW WORK IS PROGRESSING: ON SCHEDULE
DAILY SCHEDULE FOR TODAY
31,32 H-1 TO E-5 BLOCK WORK
33,34 E-7 TO F-1 BLOCK WORK
35 F-2 BLOCK WORK
WORK CONTENT
E-7 BLOCK EXCAVATION WORK.
AFTER 2M EXCAVATION, POUR CONCRETE FOR FOUNDATION.
E-7 PERFORM SAME WORK FROM POINT 1 TO POINT 5.
DETAILED INFORMATION

FIG.14

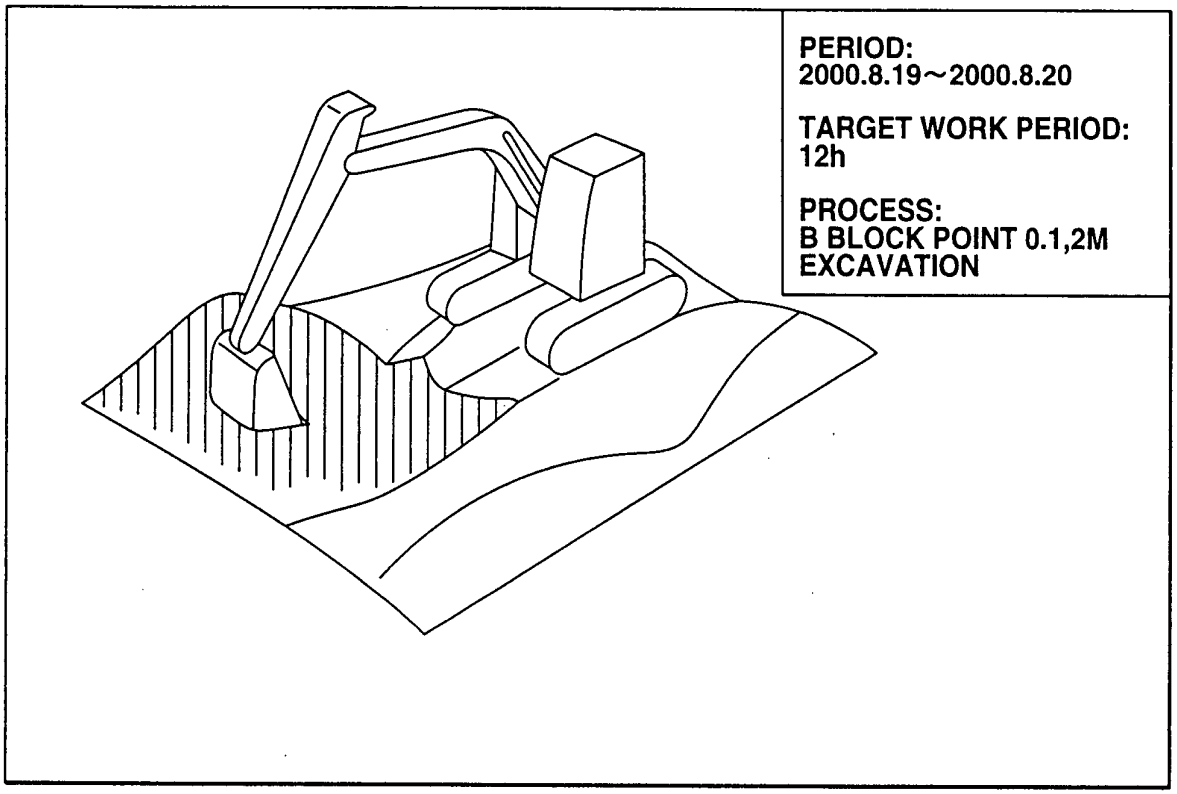

PERIOD:
2000.8.19~2000.8.20
TARGET WORK PERIOD:
12h
PROCESS:
B BLOCK POINT 0.1,2M
EXCAVATION

FIG.15

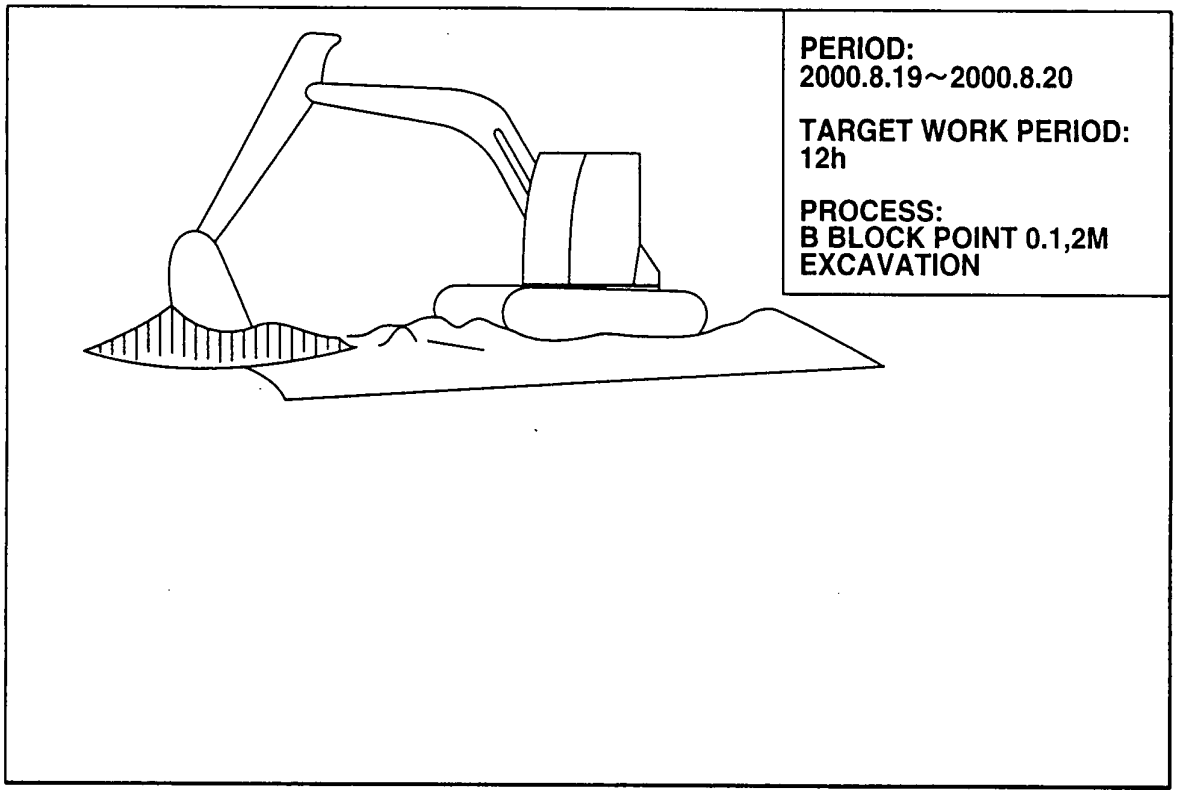

PERIOD:
2000.8.19~2000.8.20
TARGET WORK PERIOD:
12h
PROCESS:
B BLOCK POINT 0.1,2M
EXCAVATION

FIG.16

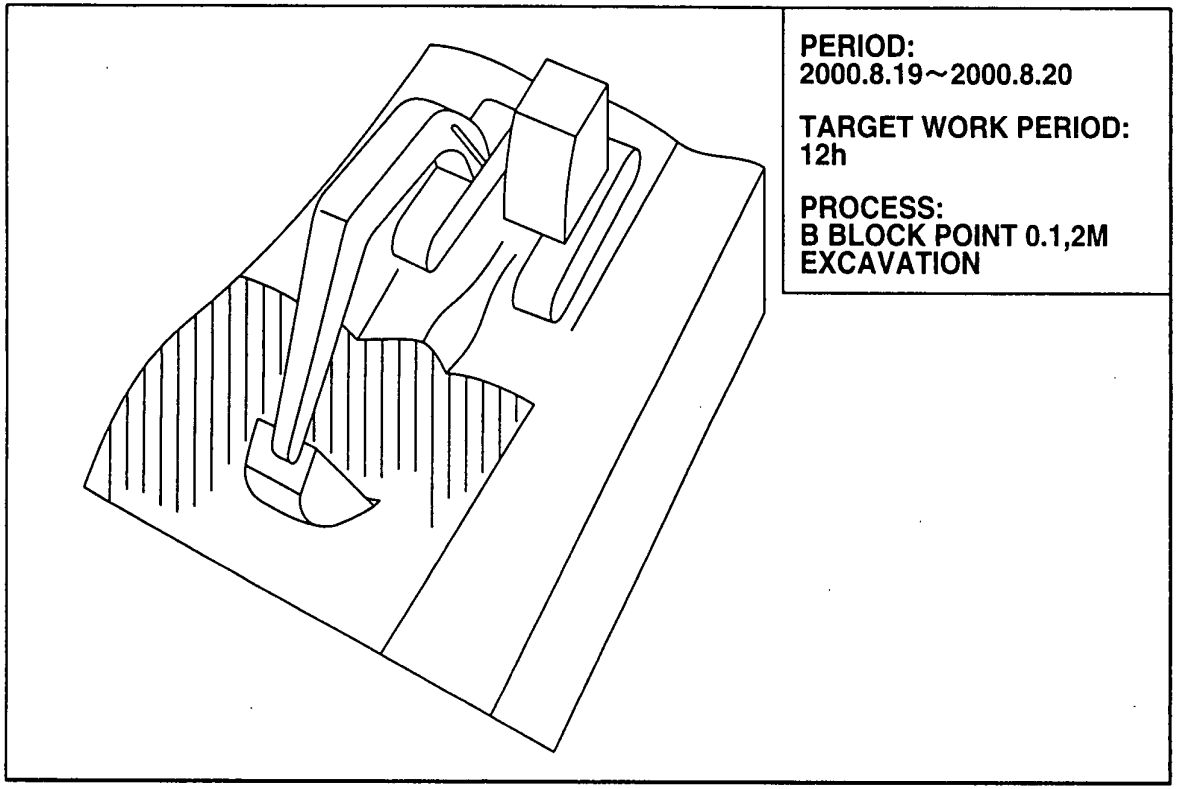

PERIOD:
2000.8.19~2000.8.20
TARGET WORK PERIOD:
12h
PROCESS:
B BLOCK POINT 0.1,2M
EXCAVATION

FIG.17(A)

f	a	b	c	d	e	g	h	k
f_1	a_1	b_1	c_1	d_1	e_1	g_1		
f_2	a_2	b_2	c_2	d_2	e_2	g_2		
f_3	a_3	b_3	c_3	d_3	e_3	g_3		

FIG.17(B)

f	a	b	c	d	e	g	h	k
f_4	a_4	b_4			e_4	g_4		
f_5	a_5	b_5			e_5	g_5		
f_6	a_6	b_6			e_6	g_6		

FIG.18

f	a	b	c	d	e	g	h	k
f_7	a_7				e_7			
f_8				d_8		g_8		